Vol. 936 Number 5

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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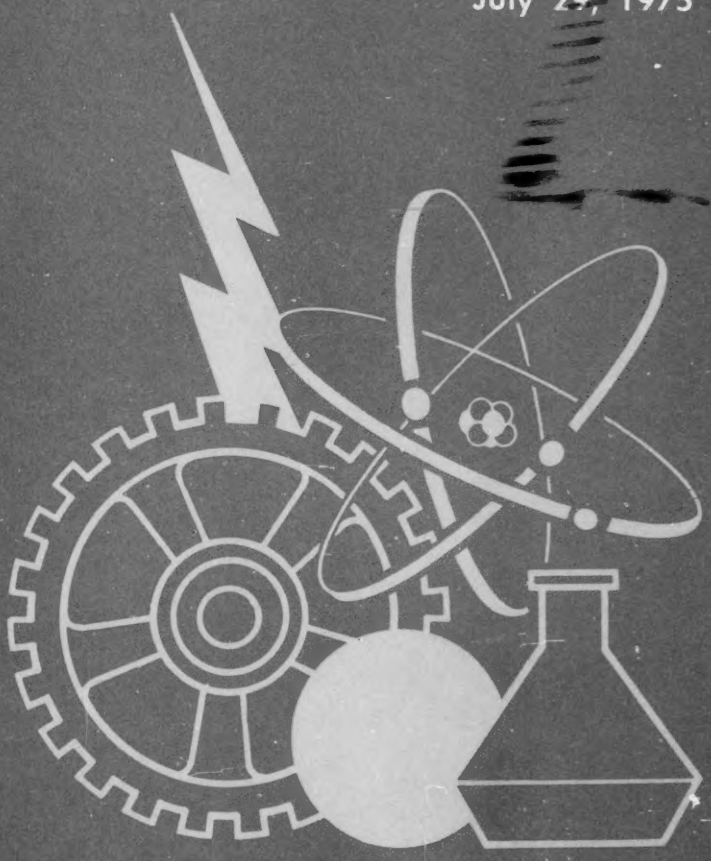
PATENTS

July 29, 1975



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

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Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Revised Format for Reissue Patents

The Specimen of the Revised Front Page Format for Reissue Patents published in 935 O.G. 7, June 3, 1975, contained a typographical error. The upper case alpha code "E" with the INID Code [11] (for document number) should have been printed instead of the upper case alpha code "B." The correct designation for Reissue Patents is reproduced below.

United States Patent [19] [11] **E Re. 12,345**
Shook [45] **Reissued Nov. 30, 1972**

Dated: July 7, 1975.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

Express Mail

This notice is in response to a number of inquiries received in the Patent and Trademark Office regarding the notice on Express Mail of February 11, 1975, published in the OFFICIAL GAZETTE of March 11, 1975 (932 O.G. 340).

There are two types of Express Mail delivery offered by the U.S. Postal Service—"Post Office to Addressee" and "Post Office to Post Office." The only type of service which can be used for Express Mail directed to the Patent and Trademark Office is "Post Office to Addressee." This service provides for delivery to one of our employees in Room 1627, Department of Commerce Building, Washington, D.C., no later than 3:00 p.m. of the next workday following its deposit before 5:00 p.m. at any postal facility with an Express Mail window.

The only address that should be used for Express Mail sent to the Patent and Trademark Office is:

"Commissioner of Patents and Trademarks
Washington, D.C. 20231."

"Post Office to Post Office" Express Mail *does not* provide for delivery but instead is retained at the postal facility of the addressee for pickup. The Postal Service *does not* notify the addressee that this type of Express Mail has been received and is awaiting pickup. If not picked up, this mail is held for 15 days and then returned to the sender.

Therefore, since the Patent and Trademark Office does not have resources for picking up any mail, including Express Mail, the "Post Office to Post Office" Express Mail will not reach the Patent and Trademark Office.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

May 15, 1975.

Mail Delays and Conditional Petitions To Revive (Trademarks)

In view of the "Post Office to Addressee" express mail service offered by the U.S. Postal Service, the conditional petition practice as to trademarks, announced in the OFFICIAL GAZETTE (921 O.G. TM 126), is hereby extended to cover this type of service.

Where the addressee is the Patent and Trademark Office, this service provides for the delivery of mail to one of our employees in Room 1627, Department of Commerce Building, Washington, D.C. 20231, no later than 3:00 p.m. on the next workday following its deposit before 5:00 p.m. at any postal facility in the United States with an Express Mail window.

It is suggested that when a communication, complying with the circumstances enumerated below, is mailed to the Patent and Trademark Office by means of the "Post Office to Addressee" express mail service and the communication is deposited at a U.S. Postal Service-Express Mail window by 5:00 p.m. on a day which is at least the day preceding the due date, a conditional petition be attached to the communication.

If the communication is received in the Patent and Trademark Office after the due date and the application becomes abandoned, the conditional petition will become effective, subject to the following requirements. The petition must include (1) an authorization to charge a deposit account for any required fees, including the petition fee, and (2) an oath or declaration signed by the person mailing the communication and also signed by the applicant or his attorney stating that the communication and petition were deposited at an Express Mail window no later than 5:00 p.m. on a day which is at least the day preceding the due date, and were requested to be mailed via the "Post Office to Addressee" Express Mail Service. Since mail handled in this manner may reasonably be expected to reach the Patent and Trademark Office no later than 3:00 p.m. of the next workday following its deposit at an Express Mail window, any mail delays beyond such time will be considered to constitute unavoidable delay to grant a petition to revive (Section 12(b) of the Trademark Act of 1946).

The circumstances under which this procedure may be used are those where the communication, if timely filed, (1) would be a proper and complete response to an action or request by the Patent and Trademark Office, and (2) would stop a period for response from continuing to run. Accordingly, this procedure would be appropriate for:

1. A response to a non-final Office action.
2. A response to a final Office action which places application in condition for publication or issue.
3. A notice of appeal and requisite fee.
4. An appeal brief.

Normal petition practices are not affected in those situations where this procedure is either not elected or not appropriate, nor does this procedure bar the granting of a petition in different fact situations where justified.

A suggested declaration form for the conditional petition is shown below:

Applicant:
Serial No.: Petition to Revive
Date Filed:
Mark:

I hereby declare that the attached communication is being deposited at an Express Mail window in a U.S. Postal Service's facility and intended to be mailed using the U.S. Postal Service's "Post Office to Addressee" Express Mail service in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, prior to 5:00 p.m. on _____, which date is at least the day preceding the due date, at _____, by
(Location)
_____
(Name of Individual)

In the event that such communication is not timely filed in the Patent and Trademark Office, it is requested that this paper be treated as a petition and that the delay in prosecution be held unavoidable.

The petition fee is authorized to be charged to Deposit Account No. _____ in the name of _____.

The undersigned declares further that all statements made herein are true, based upon the best available information; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such

willful false statements may jeopardize the validity of the application or any registration resulting therefrom.

Date _____ _____
(Signature of applicant or applicant's attorney)
And
Date _____ _____
(Signature of person mailing, if other than the above)

June 24, 1975.

BERNARD A. MEANY,
Assistant Commissioner for Trademarks.

Conditional Petitions

In view of the "Post Office to Addressee" express mail service offered by the U.S. Postal Service, the conditional petition practice, announced in the OFFICIAL GAZETTE [910 O.G. 402] and the M.P.E.P. [section 711.03(c)], is hereby extended to cover this type of service.

Where the addressee is the Patent and Trademark Office, this service provides for the delivery of mail to one of our employees in Room 1627, Department of Commerce Building, Washington, D.C. 20231, no later than 3:00 p.m. on the next workday following its deposit before 5:00 p.m. at any postal facility in the United States with an Express Mail window.

It is suggested that when a communication, complying with the circumstances enumerated below, is mailed to the Patent and Trademark Office by means of the "Post Office to Addressee" express mail service and the communication is deposited at a U.S. Postal Service Express Mail window by 5:00 p.m. on a day which is at least the day preceding the due date, a conditional petition be attached to the communication.

If the communication is received in the Patent and Trademark Office after the due date and the application becomes abandoned or the patent lapses, the conditional petition will become effective, subject to the following requirements. The petition must include (1) an authorization to charge a deposit account for any required fees, including the petition fee (35 U.S.C. 41(a) 7), and (2) an oath or declaration signed by the person mailing the communication and also signed by the applicant or his registered representative stating that the communication and petition were deposited at an Express Mail window no later than 5:00 p.m. on a day which is at least the day preceding the due date, and were requested to be mailed via the "Post Office to Addressee" Express Mail Service. Since mail handled in this manner may reasonably be expected to reach the Patent and Trademark Office no later than 3:00 p.m. of the next workday following its deposit before 5:00 p.m. at any postal facility in the United States with an Express Mail window, any mail delays beyond such time will be considered to constitute unavoidable delay to grant a petition to revive (35 U.S.C. 133) or a petition to accept delayed payment of an issue fee (35 U.S.C. 151).

The circumstances under which this procedure may be used are those where the communication, if timely filed, (1) would be a proper and complete response to an action or request by the Patent and Trademark Office, and (2) would stop a period for response from continuing to run. Accordingly, this procedure would be appropriate for:

1. A response to a non-final Office action.
2. A response to a final Office action in the form of an amendment that cancels all rejected claims or otherwise prima facie places the application in condition for allowance.
3. A notice of appeal and requisite fee.
4. An appeal brief, in triplicate, and requisite fee.
5. A base issue fee.
6. A balance of issue fee.

Categories 1–4 would include a conditional petition to revive. Categories 5 or 6 would include a conditional petition to accept the delayed payment of the issue fee.

Examples of which this procedure would not be appropriate include:

1. Application papers.
2. A response to a final Office action other than that indicated in categories 2 and 3, above.
3. Extensions of time.
4. Amendments under Rule 312.
5. Priority documents.

Normal petition practices are not affected in those situations where this procedure is either not elected or appropriate.

A suggested format for the conditional petition is shown below:

Applicant(s) _____ ☐ Petition to revive
Serial No. _____ ☐ Petition to accept delayed payment of issue fee.
Date Filed _____
Title _____

I hereby certify that the attached communication is being deposited at an Express Mail window in a U.S. Postal Service's facility and intended to be mailed using the U.S. Postal Service's "Post Office to Addressee" Express Mail service in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, prior to 5:00 p.m. on _____, which date is at least the day preceding the due date, at _____, by
(Location)
_____
(Name of Individual)

In the event that such communication is not timely filed in the Patent and Trademark Office, it is requested that this paper be treated as a petition and that the:

☐ delay in prosecution be held unavoidable—35 U.S.C. 133.
☐ delayed payment of the fee be accepted—35 U.S.C. 151.

The petition fee required by 35 U.S.C. 41(a) 7 is authorized to be charged to Deposit Account No. _____ in the name of _____.

The undersigned declare further that all statements made herein are true, based upon the best available information; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date _____ _____
(Signature of applicant or signature and registration number of Registered Representative)
And
Date _____ _____
(Signature of person mailing, if other than the above)

June 26, 1975.

WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Certificates of Correction for the Week of July 29, 1975

D. 233,138	3,853,627	3,872,573	3,878,707
D. 234,579	3,854,197	3,872,640	3,878,943
3,502,679	3,854,658	3,872,996	3,878,990
3,625,665	3,856,389	3,873,209	3,879,002
3,663,589	3,857,060	3,873,924	3,879,527
3,752,100	3,858,450	3,874,523	3,879,756
3,773,748	3,859,915	3,874,657	3,879,870
3,786,020	3,860,199	3,874,691	3,879,922
3,807,980	3,860,393	3,874,803	3,879,948
3,809,862	3,860,707	3,874,904	3,879,976
3,820,479	3,860,801	3,875,007	3,879,989
3,820,670	3,861,410	3,875,133	3,880,037
3,824,558	3,861,502	3,875,289	3,880,273
3,825,771	3,863,215	3,875,342	3,880,608
3,825,781	3,863,543	3,875,411	3,880,729
3,826,669	3,863,991	3,875,459	3,880,744
3,828,943	3,864,074	3,875,755	3,880,888
3,831,596	3,864,122	3,875,870	3,880,919
3,832,371	3,864,311	3,876,098	3,881,049
3,835,104	3,864,347	3,876,204	3,881,321
3,837,377	3,864,373	3,876,230	3,881,384
3,838,496	3,864,670	3,876,562	3,881,528
3,838,797	3,865,041	3,876,564	3,881,684
3,841,288	3,866,859	3,876,715	3,882,163
3,841,608	3,867,427	3,876,719	3,882,201
3,843,822	3,868,159	3,876,833	3,883,036
3,843,825	3,868,456	3,876,861	3,883,715
3,844,425	3,868,647	3,877,052	3,883,865
3,844,775	3,868,674	3,877,125	3,883,924
3,845,134	3,869,228	3,877,217	3,883,957
3,845,141	3,869,230	3,877,626	3,883,979
3,845,827	3,869,342	3,877,798	3,884,129
3,845,830	3,869,554	3,877,901	3,884,323
3,849,758	3,870,445	3,878,035	3,884,526
3,851,012	3,870,805	3,878,081	3,885,087
3,852,174	3,871,026	3,878,133	3,835,234
3,852,581	3,871,169	3,878,227	3,886,019
3,852,857	3,871,707	3,878,354	3,886,336
3,853,213	3,871,856	3,878,617	
3,853,613	3,872,479	3,878,644	

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 21, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-23-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-1-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-1-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-7-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-4-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-4-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-2-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-4-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	11-29-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-2-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-2-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-13-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	10-18-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-2-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	10-8-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	12-10-74

Expiration of patents: The patents within the range of numbers indicated below expire during July 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,840,821 to 2,845,624 inclusive
Plant Patents..... Numbers 1,722 to 1,739 inclusive

REISSUES

JULY 29, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,491

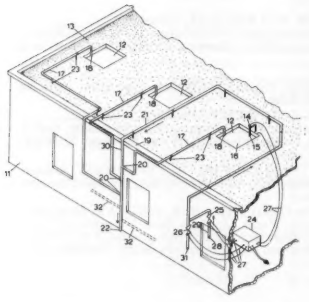
ROOF DRAINING SYSTEM

Robert L. Kundert, Madison, Wis., assignor to Drain-Away, Inc., Madison, Wis.

Original No. 3,692,040, dated Sept. 19, 1972, Ser. No. 105,322, Jan. 11, 1971. Application for reissue July 3, 1974, Ser. No. 485,715

Int. Cl. F16l *43/00*

U.S. Cl. 137—142 **8 Claims**



1. In combination with a substantially horizontal roof, a roof draining system for draining away water that accumulates on the roof, said roof draining system comprising,

a. at least two sumps installed on said roof, including one of which is a control sump,

b. at least two siphon pipes, each pipe having an intake end and a discharge end, the intake end of one of said pipes extending into said control sump substantially to the bottom thereof and the intake end of each of the other siphon pipes extending into one each of the other said sumps substantially to the bottoms thereof, each of said siphon pipes extending therefrom over the edge of said roof and downwardly to their respective discharge ends,

c. a priming-discharge pipe for initiating the siphoning action of said siphon pipes, said priming-discharge pipe having an inlet end and a discharge end, said priming-discharge pipe extending from said inlet end across said roof and over the edge of said roof downwardly to its discharge end, the discharge end of the siphon pipe associated with said control sump being connected to the downwardly extending portion of said priming-discharge pipe between said roof edge and the discharge end of said priming-discharge pipe, and the discharge end of each of said other siphon pipes being connected to the downwardly extending portion of said priming-discharge pipe at vertically spaced intervals between the connecting point of said first connected siphon pipe and the discharge end of said priming-discharge pipe,

d. means for introducing water into the inlet end of said priming-discharge pipe connected to said means,

e. a water detecting probe extending into the control sump in spaced relation with the bottom of said control sump, and

f. control means operatively connected to said probe, said control means connected to and actuating said means for introducing water to said priming-discharge pipe when said probe detects water in said control sump.

4. In combination with a roof structure having a plurality of liquid accumulating areas defining sump means, a roof draining system comprising a plurality of interconnecting pipe means coupled individually at least one each to said sump means; a generally vertically located discharge pipe means mounted adjacent to said roof structure, a plurality of interconnecting pipe means connected to said sump means and to said discharge pipe means and being connected to said discharge pipe means in vertically staggered relation to each other to maintain siphon action independently of each other, and initiating means to introduce liquid into said discharge pipe means for initiating a downward flow of liquid through said pipe means from the uppermost of said connecting pipe means to thereby initiate a siphon action for withdrawing water from said several sump means.

Re. 28,492

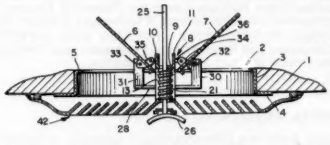
DAMPER UNIT FOR CONTROLLING AIR FLOW

Warren R. Hedrick, and Henry J. Meurer, both of Holland, Mich., assignors to Allied Thermal Corporation, New Britain, Conn.

Original No. 3,592,240, dated July 13, 1971, Ser. No. 771,835, Oct. 30, 1968. Application for reissue July 12, 1973, Ser. No. 378,394

Int. Cl.[2] F16K *1/18*

U.S. Cl. 137—316 **9 Claims**



5. In a damper unit for regulating air flow and having a frame member with an opening therethrough for the passage of air, a support extending transversely of the frame member and secured thereto, a pair of opposed damper blades mounted for generally pivotal movement about the adjacent edges thereof upwardly toward each other to open position and downwardly away from each other to closed position, the improvement which comprises:

a. a worm rotatably mounted on the support and extending downwardly therefrom,

b. an operating member including a relatively flat strip extending transversely of said support below said blades, and engaging at least one of the teeth on said worm and adapted to move axially thereof when said worm is rotated,

c. means including two arms, one on each side of said support [and] rigidly secured [thereto] *to and* extending from said strip upwardly toward said damper blades, for

connecting said damper blades with said operating member [and with the support, whereby rotation of said worm will cause said operating member to move axially of said worm, thereby to move said damper blades toward or away from each other], and

d. pivot means connecting each said [worm] *arm* with one of said damper blades [.], *whereby rotation of said worm will cause said operating member to move axially of said worm, thereby to move said damper blades toward or away from each other.*

Re. 28,493

WIRE WALL PARTITION

Robert G. Weeden, Woodbridge, Canada, assignor to Anthes Equipment Ltd., Port Credit, Canada

Original No. 3,734,467, dated May 22, 1973, Ser. No. 144,773, May 19, 1971. Application for reissue Sept. 23, 1974, Ser. No. 508,516

Claims priority, application Canada, Sept. 10, 1970, 92747

Int. Cl.[2] E04H *17/04*

U.S. Cl. 256—65 **2 Claims**

1. A section for use in a wall partition, safety rail and the like, the section comprising:

a substantially rectangular panel element [having a thickened peripheral portion adjacent each one of its sides;] *of wire mesh comprising a plurality of spaced-apart and parallel wires intersecting other spaced-apart and parallel wires and welded in place, the peripheral portions of the panel element having a maximum thickness constituted by the combined thicknesses of the two intersecting wires at each junction;*

four elongated members [adapted to support] *framing* the panel element, [each] *at least one* of the members being of substantially square cross-section having opposed spaced-apart longitudinal edges defining a slot, having a width less than the *maximum* thickness of [said thickened] *the adjacent and corresponding* peripheral portion [and sufficiently large] *of said panel element but greater than the thickness of each wire of the panel element*, to permit the member to slide longitudinally [over] *along the respective peripheral portion of* the panel element [adjacent an edge thereof and thereby enclose and entrap said thickened] *so that the said at least one member encloses and traps the corresponding* peripheral portion *of the panel element;*

coupling means adapted to couple adjacent ends of the members at all four corners of the panel element in order to lock said elongated members in a rectangular form with the panel element restrained by the [thickened] peripheral portion to prevent separation of the panel element from the elongated members, said coupling means comprising four pairs of brackets and a fastener for engagement in the brackets to draw pairs of brackets together about an adjacent pair of ends of the elongated members, each bracket having a U-shaped portion defining a channel, the U-shaped portion being in two parts at right-angles to one another for receiving respective end parts of adjacent elongated members in the channel, each bracket further comprising a triangular web extending between said parts of said U-shaped portion, the web having at least one opening for receiving the fastener;

telescopic uprights having ends adapted to frictionally engage respective adjacent floors of a building and including spring means applying outward forces to increase the frictional engagement of said ends of the uprights on the floors; and

attaching means adapted to attach said section to said uprights, each attaching means comprising a hook member slidably engaged in said telescopic member and frictionally locked in place by said spring means when the telescopic upright is in position between floors, said hook member being adapted to be positioned about overlapping portions of adjacent sections to hold said sections against the telescopic upright.

Re. 28,494

METHOD OF PROCESSING STAINLESS STEEL STRIPS OR SHEETS

Wilson S. Rowe, Valparaiso, Ind., assignor to United States Steel Corporation, Pittsburgh, Pa.

Original No. 3,776,784, dated Dec. 4, 1973, Ser. No. 271,881, July 14, 1972. Application for reissue May 6, 1974, Ser. No. 447,457

Int. Cl.[2] C21D *9/46*

U.S. Cl. 148—12 EA **1 Claim**

1. In the process for producing stainless steel sheet and strip containing not more than 19% chromium wherein the steel is hot rolled to hot band gauge of about 0.10-inch, cooled, descaled, then cold rolled to final gauge and continuous annealed [at a temperature of from about 1700 to about 1850°F at a line speed sufficient] to effect substantially complete recrystallization and finally descaled; the improvement comprising eliminating the descaling step after hot rolling so that the steel is cold rolled and annealed with mill scale on the surface thereof thereby permitting a line speed up to 50% faster during said continuous anneal following the cold roll.

Re. 28,495

POLY (HEXASUBSTITUTED MELAMINES)

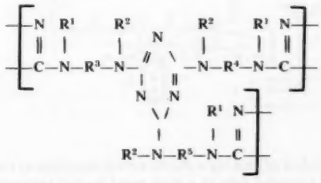
Bruce A. Langager, St. Anthony Village, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original No. 3,779,997, dated Dec. 18, 1973, Ser. No. 261,924, June 12, 1972. Application for reissue June 6, 1974, Ser. No. 476,911

Int. Cl. C08g *33/02*

U.S. Cl. 260—77.5 R **13 Claims**

1. Poly(hexasubstituted melamines) consisting of segments having the formula



wherein R^1 and R^2 are each lower alkyl, cyclo-lower alkyl, aryl, and alkaryl, each being optionally substituted by one or two chlorine or one to three fluorine atoms or by lower perflu-

oroalkyl, lower alkoxy or aralkoxy group; R^3, R^4 and R^5 are the same or different and are divalent alkylene having from 1 to 20 carbon atoms, cycloalkylene having from 3 to 6 carbon atoms, piperidyl and R^1, R^2 and R^3 taken together with the two triazine nitrogen atoms to which they are attached form a divalent 1,3-bis[4-1-piperidyl)] trimethylene radical.

Re. 28,496
CINNAMYL CARBAMATES

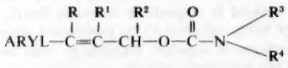
Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Original No. 3,697,582, dated Oct. 10, 1972, Ser. No. 719,700, Apr. 8, 1968. Application for reissue Nov. 16, 1972, Ser. No. 307,259

Int. Cl. C07c *25/06*

U.S. Cl. 260—482 C **12 Claims**

[1. A compound having the formula



wherein ARYL is selected from the group consisting of phenyl, naphthyl, substituted phenyl and substituted naphthyl in which said substituents are selected from the group consisting of halogen, lower alkoxy, lower alkyl, and provided that when ARYL is substituted phenyl the substituent is also 3,4-oriented-methylenedioxy;

R and R^1 are independently selected from the group consisting of hydrogen, lower alkyl, chlorine and bromine;

R^2 is selected from the group consisting of hydrogen, lower alkyl and phenyl; and

R^3 and R^4 are independently selected from the group consisting of hydrogen, alkyl, lower alkenyl, carbethoxymethyl, phenyl and substituted phenyl in which said substituents are selected from the group halogen, lower alkoxy, lower alkyl and nitro; provided that only one of R^3 or R^4 is phenyl or substituted phenyl; and further provided that when ARYL is phenyl then R^3 or R^4 is not phenyl.]

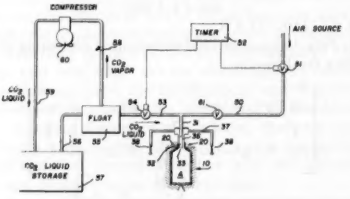
Re. 28,497
METHOD OF AND APPARATUS FOR MAKING A PLASTIC ARTICLE

Richard C. Gasmire, Dallas, Tex., assignor to Owens-Illinois, Inc., Toledo, Ohio

Original No. 3,065,501, dated Nov. 27, 1962, Ser. No. 846,720, Oct. 15, 1959. Application for reissue July 9, 1973, Ser. No. 377,309

Int. Cl. B29c *17/07, 25/00*

U.S. Cl. 264—28 **26 Claims**



23. In a method of making a plastic article the steps of enclosing a heated, extruded tube in a blow mold having interior chill walls, introducing into said tube a gaseous blowing medium at substantially an ambient temperature to expand the tube against the chill walls of the enclosing mold, subsequently introducing into the expanded tube a non-gaseous chilling medium and effecting a change of state in said chilling medium to form a solid vapor mixture internally of the tube to cool the previously expanded tube.

Re. 28,498
METHOD OF PRODUCING A THICK-WALLED CURED PLASTICS MOULDING

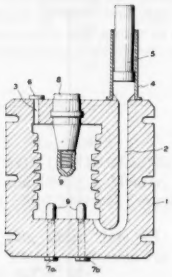
Eugen Kusenberg, Basel; Ernst Hubler, Fullinsdcrf; Hans-Rudolf Aus der Au, Reinach, Basel-Land, and Otto Ernst, Pfeffingen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Original No. 3,777,000, dated Dec. 4, 1973, Ser. No. 273,171, July 19, 1972. Continuation of Ser. No. 45,123, June 10, 1970, abandoned. Application for reissue Feb. 26, 1974, Ser. No. 446,104

Claims priority, application Switzerland, June 19, 1969, 9385/69

Int. Cl. B29g *7/00*

U.S. Cl. 264—327 **3 Claims**



1. In a method of producing a cured plastic molding which is comprised of the steps of providing a mold having an inlet gate and having a volume of at least several hundred cubic centimeters and at least one compact zone with a volume sufficiently large to contain an inscribed sphere of at least four centimeters and which will produce a thick walled molding, providing a highly reactive crosslinkable resin composition which is capable of setting within a period of from three to sixty minutes and has a setting temperature at which said setting takes place and which has an exothermic curing reaction, preheating the mold to a temperature sufficient to initiate curing of said resin composition, and pouring the resin composition into the mold to form a casting, the improvements comprising:

a. prior to the step of pouring, preheating the resin composition to a pouring temperature at which the resin composition is liquid and which is [at least 10%] *from 10–56* below the temperature to which the mold has been preheated, the temperature to which the mold has been preheated and the pouring temperature being so chosen that, at the rate of pouring, the temperature in the center of the resin composition in the mold will not reach the temperature of the resin composition at the mold wall until the casting has sufficiently set to enable it to be removed from the mold,

b. during the pouring step, maintaining the supply of liquid resin composition into the mold during the gelling phase of the resin composition in the mold and maintaining the temperature of the liquid resin composition flowing through the inlet gate of the mold at least approximately at the pouring temperature, and

c. at least from the point of time at which the mold is substantially filled, exerting pressure on the supply of liquid resin composition for supplying the composition with the

mold at a pressure sufficient to compensate for shrinkage, whereby only minor temperature gradients arise in different parts of the casting during the gelling and setting of the resin composition, and the casting can be removed from the mold after short periods of time.

Re. 28,499

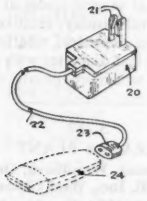
POWER PACK

Robert W. Flentge, Roselle, Ill., assignor to A. F. Dormeyer Mfg. Co., Inc., Chicago, Ill.

Original No. 3,711,806, dated Jan. 16, 1973, Ser. No. 215,023, Jan. 3, 1972. Application for reissue Mar. 15, 1974, Ser. No. 451,517

Int. Cl. H01f *27/02*

U.S. Cl. 336—92 **16 Claims**



1. A power pack for use with a small electrical appliance to to reduce line voltage and provide a low operating voltage, said power pack comprising a transformer subassembly enclosed within a case and cover assembly from which project primary terminals for plugging into a wall outlet and a secondary line cord or terminals for connection to the appliance, said transformer subassembly including a bobbin molded for electrical insulating material, primary and secondary windings on the bobbin, secondary soldering lugs anchored to the bobbin and connected to the secondary winding and the secondary line cord, primary terminals carried in channels formed in the bobbin connected to the primary winding, a laminated iron core fastened to the bobbin and surrounding the windings, insulating flanges integrally formed on the bobbin for insulating the laminated core from the primary terminals and the secondary lugs, locating holes in said laminated core, said case and cover assembly including transformer locating pins for engaging said laminated core locating holes to orient the transformer subassembly within the case and cover assembly, said cover including openings for the primary terminals to project therethrough, and means on the cover coacting with the bobbin to lock the terminals in the channels and inhibit movement thereof.

Re. 28,500

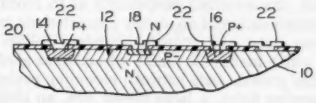
LOW NOISE FIELD EFFECT TRANSISTOR WITH CHANNEL HAVING SUBSURFACE PORTION OF HIGH CONDUCTIVITY

Heber J. Bresee, Campbell, Calif., and James L. Bowman, Portland, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Original No. 3,656,031, dated Apr. 11, 1972, Ser. No. 97,730, Dec. 14, 1970. Application for reissue Dec. 19, 1973, Ser. No. 426,259

Int. Cl. H01l *5/00*

U.S. Cl. 357—22 **10 Claims**



1. In a field effect semiconductor device having a substrate of one conductivity type including source and drain regions of the other conductivity type and a channel portion of the other conductivity type extending between the source and drain regions with a gate electrode disposed thereon, the improvement comprising:

said channel portion having an outer surface on one side of said substrate, *a bottom portion*, and a subsurface portion of higher electrical conductivity relative to and spaced below said outer surface of said channel at an intermediate position between said outer surface and [the] *said* bottom *portion* of said channel for reducing the noise in the output signal of said device [.] , *said subsurface portion having a doping impurity concentration which is several times greater than that of said outer surface and said bottom portion of said channel, said outer surface, said bottom portion, and said subsurface portion being of the same conductivity type.*

PLANT PATENTS

GRANTED JULY 29, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,748
ROSE PLANT
O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91762
Filed Apr. 16, 1974, Ser. No. 461,403
Int .Cl. A01h *5/00*

U.S. Cl. Plt.—20 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid grandiflora class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of an ideally characteristic grandiflora type plant habit and growth, abundant foliage of good quality which makes the plants attractive as garden plants during the growth cycle between blooming periods, a prolific blooming habit, a large flower size, an ability of the flowers to hold well on the plants for at least 5 or 6 days without fading or shattering, and a distinctive and attractive apple-red flower color which appears as a glowing and fluorescent-like overlay on the petals.

3,749
ROSE PLANT
Roy L. Byrum, Richmond, Ind., assignor to Joseph H. Hill Company, Richmond, Ind.
Filed May 10, 1974, Ser. No. 468,893
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant substantially as herein shown and described, characterized by the soft pink color of the flowers and its free growing habits which provide a continuous and abundant year around production of blooms borne on strong erect stems.

3,750
BEGONIA PLANT
Andrew J. Brown, Sr., Cardiff, Calif., assignor to Mikkelsens Inc., Ashtabula, Ohio
Filed May 15, 1974, Ser. No. 470,024
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of *Begonia elatior* characterized particularly when compared to the present cultivar Bernsteins Gelbe by its darker yellow tepals with slightly ruffled edges; by the frequent occurrence of five tepals rather than four; its deeper yellow anthers; slower plant growth; faster leaf propagation; less flower color fading, with less pinking of the reverse side of the tepals, and by its shorter plant height.

3,751
BEGONIA PLANT
James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens Inc., Ashtabula, Ohio
Filed May 31, 1974, Ser. No. 475,199
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of begonia plant characterized particularly by its bright rose colored flowers; improved shoot initiation, with leaf cuttings consistently producing five to seven shoots at base of leaf petiole; fast rooting habit, with leaf cuttings being well established in 21 to 25 days at 22° C.; more floriferous habit, with the flowers being clustered in the truss; the initiation and development of flowers at several nodes at one time thereby presenting greater floral display; relatively small flowers, measuring 4–6 cm. in diameter; relatively short growth habit; relatively small leaf diameter with closer internodes, and by its flower buds which are initially oblong and rolled.

3,752
AZALEA PLANT
Kenneth Frank Fessler, Woodburn, Oreg., assignor to Geo. J. Ball, Inc., West Chicago, Ill.
Filed July 2, 1974, Ser. No. 485,095
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—56 **1 Claim**

1. The new and distinct variety of azalea plant substantially as herein shown and described, characterized by being a sport of Dogwood (Plant Pat. 3,093), similar to its parent in form, shape and growth habit but being distinguished by the bright pink color of its blossoms.

3,753
BEGONIA PLANT
James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens Inc., Ashtabula, Ohio
Filed July 10, 1974, Ser. No. 487,397
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia characterized particularly as to uniqueness when compared to the parent cultivar Krefeld Orange by dark red tepals which quite frequently are six in number, and by its anthers which are a deeper yellow than the anthers of Krefeld Orange.

3,754
BLACK ASH TREE
Ashur L. Cordes, Rte. 1, Box 44, Beresford, S. Dak. 57004
Filed July 15, 1974, Ser. No. 488,535
Int. Cl. A01h *5/12*

U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct variety of black ash tree of the species botanically known as *Fraxinus nigra,* substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a distinctly upright and narrow habit of growth and columnar tree head, with a width approximately one-third its height when grown in full sunlight, uniform foliage, and sparse seed production.

PATENTS

GRANTED JULY 29, 1975

ERRATA

For CLASS	See PATENT NO.
228–180	3,896,541
228–234	3,896,542
033–300	3,896,619
108–108	3,896,718
128–214 R	3,896,733
114–021 W	3,896,767
164–252	3,896,878
172–004.5	3,896,899
241–005	3,896,984
312–257 R	3,897,103
355–003 P	3,897,143

PATENTS

GRANTED JULY 29, 1975

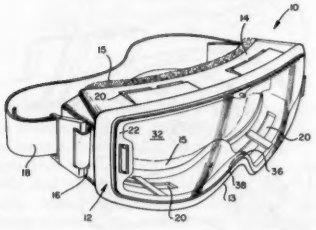
GENERAL AND MECHANICAL

3,896,496

INTERCHANGEABLE LENS SKI GOGGLE

Conrad Leblanc, Leominster, and Vitalino Marchi, Concord, both of Mass., assignors to Foster Grant Co., Inc., Leominster, Mass.

Filed Apr. 29, 1974, Ser. No. 465,401
Int. Cl.[2] A61F *9/02*
U.S. Cl. 2—14 D **5 Claims**



1. A pair of interchangeable lens goggles comprising;

a. a flexible face mask for engaging the wearer's face having a lens opening;

b. a separate rigid plastic mounting member supported by said flexible face mask and extending substantially completely around the periphery of said lens opening therein, a portion of said separate rigid plastic mounting member being embedded in the flexible face mask substantially completely around the periphery of said lens opening, said separate rigid plastic mounting member having a further portion extending inwardly of said lens opening in said flexible face mask providing a continuous rigid supporting surface upon which a lens may be mounted before the wearer's eyes, said rigid member having a locking means thereon for directly engaging a lens and maintaining it in its supported position while allowing removal of the lens when it is desired to interchange the lens with another;

c. a transparent lens having means formed therein to engage said locking means on said rigid member, said lens when locked in its operative position having its entire outer edge portion overlapping and being rigidly supported only by said separate rigid plastic member, and;

d. means engaging the wearer's head for holding said face mask thereagainst.

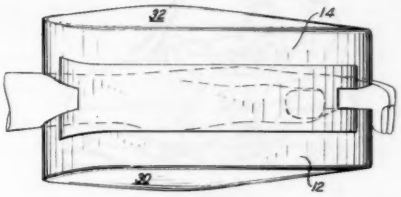
3,896,497

PROTECTIVE TARGET DEVICE

Jhoon Goo Rhee, 2525 N. Ridgeview Rd., Arlington, Va. 22207

Filed Oct. 25, 1974, Ser. No. 518,047
Int. Cl.[2] A41B *13/00*
U.S. Cl. 2—20 **10 Claims**

1. A protective device adapted to be worn on and protect the hand of a person for use in developing skills in athletic contents comprising a pair of pad members secured together in spaced parallel relationship thereby providing an open space between said pads, openings on opposite sides of said pad members whereby said hand can be inserted into said open space, each of said pad members comprising pliable,



tearresistant casing means having resilient energy-absorbing means disposed therein.

3,896,498

PALM GUARD

Steven L. Pang, Los Angeles, Calif., assignor to Thomas F. Luthi, Los Angeles, Calif.

Filed Oct. 29, 1974, Ser. No. 518,273
Int. Cl.[2] A41D *13/00;* **A47J** *45/10*
U.S. Cl. 2—20 **10 Claims**

1. A palm guard comprising a palm portion adapted to rest flat against and cover a substantial portion of the palm of a user's hand, first and second strip portions joining to and extending from opposite side edges of said palm portion, said first and second strip portions being doubled back upon themselves to encircle the hand of the user, the ends of the first and second strip portions being permanently joined together to form a continuous back strap, a third strip portion joining to and extending from the upper edge of said palm portion, said third strip portion being adapted to pass between the third and fourth fingers of the user's hand, said third strip portion being doubled back upon itself and its end being permanently joined to said back strap, a fourth strip portion joining to and extending from the lower edge of said palm portion, said fourth strip portion being adapted to pass around the base of the user's thumb, said fourth strip portion being doubled back upon itself and its end permanently joined to said back strap, said palm portion and said strips all being formed from flexible sheet material.

3,896,499

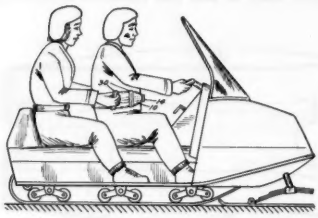
SAFETY BELT FOR SNOWMOBILE AND MOTORCYCLE PASSENGERS

Charles E. Kelly, Rt. 2, Spicer, Minn. 56288

Filed Nov. 18, 1974, Ser. No. 524,411
Int. Cl.[2] A41F *9/00*
U.S. Cl. 2—311 **9 Claims**

1. A safety belt adapted to be worn by a driver of a vehicle, said belt including:

a. a relatively wide, elongated belt band terminating in ends;
b. coupling means releasably interconnecting the ends of the belt band; and



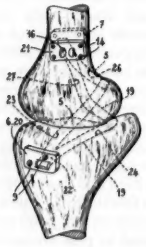
c. right and left vertical loops extending entirely around said belt and extending outwardly therefrom, said loops being fastened to said belt and being of configuration such that a passenger riding in tandem behind a driver wearing such a safety belt may insert portions of her arms including her hands through said loops.

3,896,500

METHOD OF AND PROSTHESIS FOR RESTORING LIGAMENTS OF A JOINT

Andre Rambert, Residence Florentine, Ave. Lacassagne, Lyon, and Gilles Bousquet, 19 Ave. Berranger, Ecully, both of France

Filed Jan. 8, 1974, Ser. No. 431,667
Claims priority, application France, Jan. 17, 1973, 73.02342
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **16 Claims**



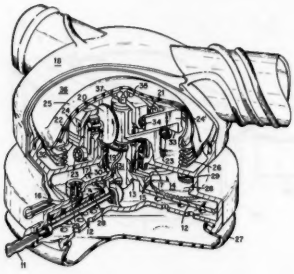
2. A prosthesis for restoring ligaments of a joint, comprising at least one artificial ligament constituted, by at least one pair of strands of thread forming, at one of their ends, a loop and covered by a sheath and by two attachment plates comprising a part in the shape of a bridge and each of which is able to be fixed by screws to one of the bones corresponding to an end of a tunnel traversing the respective bone, the bridge-shaped part of one of the plates being previously engaged in the loop-shaped end of the artificial ligament whereas the bridge-shaped part of the other plate is provided with means capable of ensuring the retention of the free end of the artificial ligament.

3,896,501

MECHANICAL DRIVE FOR BLOOD PUMP

Natale J. Bifano, Pittsburgh, and Walter David Pouchot, Monroeville, both of Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 2, 1973, Ser. No. 412,397
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.7 **1 Claim**



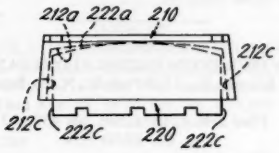
1. A blood pump of an artificial heart comprising:
a substantially hemispherical pump housing;
a drive shaft extending into said housing;
a rotatable flywheel disposed in said housing and having a diameter slightly less than the maximum inner diameter of said housing;
meshing bevel gears disposed on said shaft and said flywheel for rotating said flywheel;
a compound planetary gear set disposed within housing comprising a sun gear integral with said flywheel, a stationary ring gear affixed to said housing, compound planetary gears meshing with said sun gear and the ring gear, and a spider carrying said planetary gears and rotatable within said housing by said planetary gears at a speed less than the rotational speed of said flywheel;
a single bevel gear secured to and rotatable by said spider;
a pair of bevel gears meshing with said single bevel gear having their axis of rotation parallel to one another and rotatable by said single bevel gear;
a rotatable crank arm attached to each of said pair of bevel gears;
a pair of scotch yokes disposed within said housing with each of said yokes in contact with each of said cranks and vertically displaceable in response to the rotation of said cranks;
a diaphragm disposed within said housing above said scotch yokes and defining with said housing a blood receiving chamber; and
a pusher cup disposed intermediate said diaphragm and said scotch yokes and alternately displaceable by said scotch yokes upon the vertical displacement thereof by said crank for moving the diaphragm into said chamber and expelling blood therefrom and by the blood entering the chamber when said scotch yokes are not vertically displaced by said cranks.

3,896,502

ENDOPROSTHETIC BONE JOINT DEVICES

William Murdoch Lennox, Cheltenham, England, assignor to National Research Development Corporation, London, England

Filed Jan. 7, 1974, Ser. No. 431,402
Claims priority, application United Kingdom, Jan. 12, 1973, 1789/73
Int. Cl. A61f 1/24
U.S. Cl. 3—1.91 7 Claims



1. An endoprosthetic ankle joint device comprising:

a tibial component in the form of a trough defining a concave inner surface having a substantially part-cylindrical longitudinal surface portion with curved cross-sectional profile, and two end surface portions respectively longitudinally closing said longitudinal surface portion, and defining a rear outer surface which is located remotely from said longitudinal surface portion and is provided with a low relief configuration; and

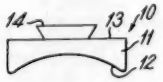
a talar component of roller form defining a convex surface having a substantially part-cylindrical longitudinal surface portion and longitudinally opposed end surface portions, said convex surface being substantially complementary to and in mutually articulatory bearing engagement with said concave surface, and defining a rear surface which is located remotely from said convex surface and is provided with a low relief configuration.

3,896,503

ENDOSPHOSTHETIC ANKLE JOINT DEVICES

Michael Alexander Reykers Freeman, London; Geoffrey Edward Kempson, Flackwell Heath, and Michael Anthony Tuke, Sutton, all of England, assignors to National Research Development Corporation, London, England

Filed Feb. 6, 1974, Ser. No. 440,274
Claims priority, application United Kingdom, Feb. 9, 1973, 6507/73
Int. Cl. A61f 1/24
U.S. Cl. 3—1.91 5 Claims



1. An endoprosthetic ankle joint device comprising:

a tibial component in the general form of a first rectangular block having one side grooved to define a concave surface of substantially part-circular cylindrical shape, said concave surface opening at its longitudinal ends into two opposed sides of said first block serially adjacent said one side, and the side of said first block opposite said one side being provided with a low relief configuration; and

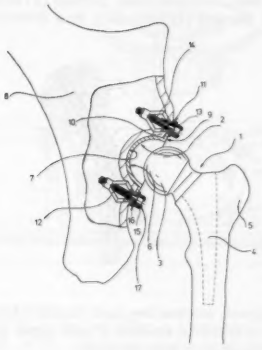
a talar component in the general form of a second rectangular block having three serially-adjacent sides cut away to define a convex surface of substantially part-circular cylindrical shape complementary to and in mutual articulatory bearing engagement with said concave surface, and the side of said second block opposite said convex surface being provided with a low relief configuration.

3,896,504

HIP JOINT PROSTHESIS

Artur Fischer, Altheimer Strasse 219, Tumlingen, Germany

Filed Oct. 15, 1973, Ser. No. 406,397
Claims priority, application Germany, Oct. 14, 1972, 2250501
Int. Cl.[2] A61F 1/24
U.S. Cl. 3—1.912 4 Claims



1. A hip joint prosthesis for jointing the femur to the ilium which has an osseous corticalis surrounding a hollow space filled with sponge-like medulla and formed with a concave depression circumferentially surrounded by an osseous bead, comprising a socket member having a convex portion adapted to be received in the concave depression of the corticalis of the ilium, and a flange portion surrounding said convex portion and adapted to overlie and contact the corticalis of the bead when said convex portion is received in the concave depression of the ilium, said flange portion being formed with circumferentially distributed apertures to be aligned with bores which are provided in the corticalis of the bead and extend into the hollow space of the illium; and a plurality of expansion anchors for connecting said socket member to the ilium and including expansion anchor sleeves inserted into the respective apertures of said flange portion so as to extend into the bores in the corticalis of the bead and into the hollow space of the ilium, each of said expansion anchor sleeves including a leading portion of tubular configuration and provided with an internal screw thread, and a trailing portion extending from said leading portion and composed of a plurality of axially extending strips which are arcuately bent in transverse direction; and expander screws in said expansion anchor sleeves inserted through said trailing portion into meshing engagement with said screw thread and exerting an axial compressive force on said sleeve to effect radially outward buckling of said strips in the hollow space behind the corticalis until said expansion anchor sleeves are securely anchored behind the corticalis and said socket member is thus removably connected to the corticalis of the ilium.

3,896,505

ENDOPROSTHESIS FOR THE HIPJOINT

Franz Donatus Timmermans, Brunswiker Strasse 11a, 23 Kiel, Germany

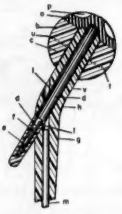
Continuation of Ser. No. 124,431, Aug. 23, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 390,138
Int. Cl. A61f 1/24
U.S. Cl. 3—1.913 2 Claims

1. A femoral head prosthesis including

a. a head portion (*a*) being at least in part of spherical shape and defining a first internal slanting channel;

b. a substantially elbow-shaped member (*g,h*) of polyethylene including a relatively short upper portion (*h*) project-

ing into said first slanting channel of said head portion (*a*) and a relatively long lower portion (*g*) enclosing an obtuse angle with said upper portion (*h*), said upper portion (*h*) and said lower portion (*g*) of said elbow-shaped member (*g,h*) defining at the junction thereof at one side a concave bent and at the other side a convex bent, said upper portion (*h*) defining a second internal channel (*v*) coaxial with said first internal channel of said head portion (*a*) having an entrance situated at the region of said convex bent, and said lower portion (*g*) defining a third internal channel (*l*) extending in a direction longitudi-



nally thereof, intersecting said second channel (*v*) and having an entrance situated at said upper portion (*h*) of said elbow-shaped member (*g,h*);

c. a first pin (*d*) having an end situated outside said elbow-shaped member (*g,h*) and projecting through said entrance at said region of said convex bent of said elbow-shaped member (*g,h*) into said upper portion (*h*) thereof; and

d. a second pin (*m*) arranged inside said third channel (*l*) and inside said lower portion (*g*) of said elbow-shaped member (*g,h*).

3,896,506

BREAST PROSTHESIS

George Hankin, and Helen A. Hankin, both of Box 32, Foster Rd., Southwick, Mass. 01077

Continuation-in-part of Ser. No. 435,229, Jan. 21, 1974. This application Jan. 13, 1975, Ser. No. 540,681

Int. Cl.[2] A61F *1/24*; A41C *3/10*

U.S. Cl. 3—36 **2 Claims**

1. The cooperating combination of a prosthetic breast form and a supporting undergarment therefor adapted to restore the human female figure and provide a symmetrical foundation for outer garments after the figure has been subjected to a mastectomy, said combination comprising a prosthetic breast form, a brassiere, means cooperatively formed on said breast form and said brassiere for securing said breast form and said brassiere in their required relative positions the breast form including a distended hermetically-sealed casing of subtantially impervious material containing an elastic gel filling, the casing consisting of a substantially conical substitute breast body portion adapted to fit into and to be worn inside the breast cup of the brassiere and a laterally projecting tongue formed as an integral extension of the substitute breast body portion and a back portion adapted to be worn against the body of the figure, the tongue being of substantially uniform thickness throughout its extent and having a front face curved slightly rearwardly from its inner end to its outer end relative to the body portion and terminating in a substantially straight rearward marginal edge, interrupting means in the form of a plurality of spaced apart projections projecting from a pair of crossed ribs disposed within the substitute breast body portion and adapted for the flow of gel therebetween, the tongue being adapted for tucking into the substitute breast body portion for varying the size and shape of the latter or for fitting the area of the body of the wearer which is below the underarm and from which tissue has been removed as an incident to breast removal.

3,896,507

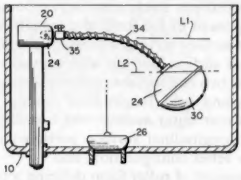
WATER ECONOMIZING FLUSH TANK

Francis M. Scarritt, Sr., 1338 Park St., N., St. Petersburg, Fla. 33710

Filed Feb. 4, 1974, Ser. No. 439,633

Int. Cl.[2] E03D *1/34*

U.S. Cl. 4—56 **3 Claims**



1. In combination, a flush tank float and a lever arm having one end connected thereto, said lever arm being for connecting the float with the fill valve of a flush tank and comprising a manually bendable undulated tube for receiving a predetermined bend, said lever arm having respective connection means at its ends for connection between a fill valve and said float and being of tubular corrugated construction and having an inherent resistance to bending sufficient to maintain said predetermined bend for transmitting the buoyant force of said float to a fill valve connected at the other end for operating said valve for closure at a selected water level in said flush tank.

3,896,508

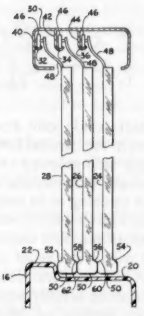
BATHING FACILITY

Troy L. Doan, 2090 Alta Vista Dr., Vista, Calif. 92083

Filed Mar. 22, 1974, Ser. No. 453,778

Int. Cl. E06b *7/02*

U.S. Cl. 4—149 **10 Claims**



1. The improvement in a bathing facility having an outer rim on one side and at least two lapping doors mounted above said rim and a single horizontal rib extending along the outer upper

margin of said rim substantially above the remainder of the top of said rim, each door being hung depending from a track of track means, each door having roller means to travel on the associated tract which supports the door in movement therealong, comprising:

a. each track being located outwardly of the bathing facility relative to the plane of the associated door so that the lower margins of said doors will tend to swing outwardly and against said rib, and

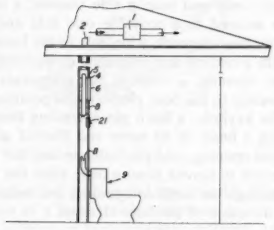
b. abutment means acting on said lower margins of said doors, spacing said doors apart.

3,896,509

VENTILATING SYSTEM FOR BATHROOMS

Donald Stipp, 1843 Loma Linda St., Sarasota, Fla. 33579, and Hull H. Craven, 4218 Patty Way, Sarasota, Fla. 33580

Filed Apr. 11, 1974, Ser. No. 459,907
Int. Cl. E03d *9/04*
U.S. Cl. 4—209 **8 Claims**



1. In a ventilating system for bathrooms, a fan, means connecting the suction of the fan to the bathroom for withdrawing steam and moist air from the entire bathroom, and means for connecting the suction of the fan to a toilet in the bathroom for withdrawing odorous air from the toilet bowl, said means comprising an air collection box having a plurality of compartments, one compartment of said air collection box opening out into the bathroom to permit entrance of steam and moist air into the compartment from which it is drawn when the fan is operating at full speed, and an electrical system connected to the fan and embodying means for reducing the speed of operation of the fan during the withdrawal of odorous air from said toilet bowl and for operating the fan at full speed when withdrawing moist air and steam directly from the bathroom.

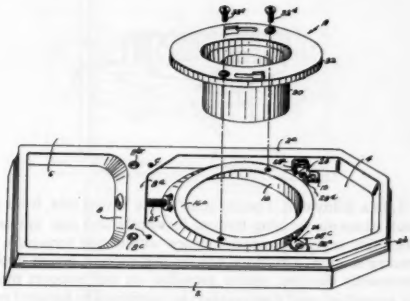
3,896,510

APPARATUS FOR INSTALLING A WATER CLOSET BOWL

Joseph F. O'Connell, 15 Sylvia St., Lexington, Mass. 02173

Filed Sept. 10, 1973, Ser. No. 395,411
Int. Cl. F16l *55/00*
U.S. Cl. 4—252 R **4 Claims**

1. Apparatus for use with a water closet bowl of the class which is recessed at its underside to provide a tubular waste discharge portion, an outer flat bottom edge extending around the waste discharge portion in spaced relationship thereto, and a bridging section transversely disposed between the tubular waste portion and the front end of the water closet and having a lower bearing surface lying in a plane passing through the bottom surface of the said bearing rim, said apparatus comprising a mounting base for receiving and supporting said outer bearing rim portion of the water closet immediately above the surface of a floor which is formed with an opening for a section of soil pipe projecting upwardly therethrough, said mounting base including an enclosure body having a flat bottom surface constructed and arranged to surround the said soil pipe opening and soil pipe, the upper side of said enclosure body presenting a continuous flat rim portion which is formed of a shape complementary to the bearing rim of the water closet, a reinforcing rib rigidly connected between two opposite sides of the continuous rim portion and being formed with a flat retaining surface arranged to fit against the underside of the said bridging section of the water closet, fastening means located through the said reinforcing rib for solidly



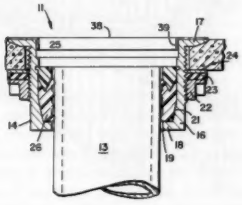
anchoring the rib to the said floor, a supporting ring member located inside of the enclosure body, fastening means for holding the ring member in spaced relation to two opposite sides of the enclosure body, screw means located transversely through the reinforcing rib and engaged in the supporting ring for detachably retaining another side thereof and a closet flange element contained within the ring.

3,896,511

SELF-CAULKING DRAIN

Casper Cuschera, 31650 Medinah St., Hayward, Calif. 94544

Filed Oct. 17, 1973, Ser. No. 407,305
Int. Cl. E03c *1/26*
U.S. Cl. 4—288 **3 Claims**



1. A drain connection for a pipe, comprising:

a fitting adapted to receive a pipe therethrough, said fitting providing an annular cavity between the interior of said fitting and exterior of the portion of said pipe received therein;

a resilient gasket of hollow, sleevelike configuration received within said annular cavity and about said portion of said pipe, said gasket including a first annular groove extending axially in one end thereof;

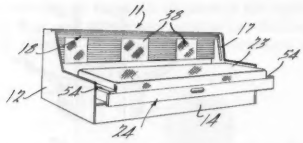
ring means including a second annular groove for forcibly engaging said first annular groove and expanding said gasket to form a watertight seal between said pipe and said fitting; and

retaining means disposed in said fitting for retaining said ring means in engagement with said first annular groove, said ring means including a ring having a flange for snapping engaging said second annular groove and being retained thereby.

3,896,512
INSTITUTIONAL BED

J. Oliver Black, 18094 Parkside, Detroit, Mich. 48221

Filed Sept. 6, 1974, Ser. No. 503,730
Int. Cl.[2] A47C *13/38, 17/14*
U.S. Cl. 5—17 5 Claims

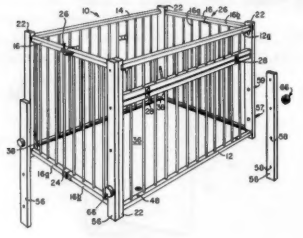


1. In a utility unit, a rectangular frame having side, front and back elements forming bottom forwardly and rear upwardly extending sections, support means within said forwardly extending section, a mattress box on said support means sloping rearwardly thereon, means provided on said support means for permitting said mattress box to be moved to forward position, and a back rest supported on said rear upwardly extending section above said mattress box in a manner which permits said back rest to be moved to a rear position on said section.

3,896,513
FOLDABLE INFANT'S CRIB

Raymond W. Boucher, and Russell D. Hand, both of Dothan, Ala., assignors to Hedstrom Co., Bedford, Pa.

Filed Sept. 3, 1974, Ser. No. 502,794
Int. Cl.[2] A47C *29/00;* A47D *7/02*
U.S. Cl. 5—99 R 17 Claims

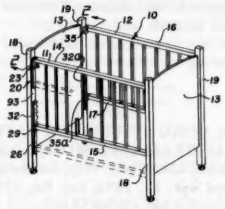


1. A folding infant's crib of the type having front and rear gates and foldable end gates pivotally connected to form a generally rectangular enclosure and a floor panel hinged to the bottom of the enclosure, the improvement comprising a double acting end gate lock for locking each of the end gates in its unfolded position, said lock including a pair of hinged-together lock sections, one lock section having a laterally extending tab and means defining a slot in said tab, said slot extending in a direction generally parallel to the end gate section to which it is attached, a latch pivoted to the other lock section adjacent to the pivot between the two sections, said latch being swingable vertically, a relatively long nose projecting from the latch, said nose being arranged to engage in the slot when the latch is swung down toward the tab with the end gate in its unfolded position, said nose having a portion which projects below the tab, and means for removably engaging the portion of the nose extending below the tab so that the first latch cannot be retracted from the slot.

3,896,514
SECURING APPARATUS FOR A DROPSIDE CRIB

Morris Feldstein, 782 W. 52nd Ave., Vancouver, British Columbia, Canada (V6P 1G6)

Filed July 1, 1974, Ser. No. 484,874
Int. Cl.[2] A47D *9/02*
U.S. Cl. 5—100 15 Claims

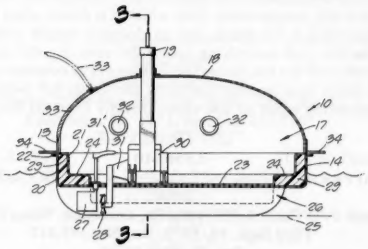


1. Securing apparatus for dropside crib comprising an elongated base element to form part of or to be secured in a vertical position on a crib end near a side thereof, a connector element to be secured to a movable crib side and slidably connected to the base element, a keyhole in the base element and formed with a narrow slot extending downwardly from a relatively large opening, a bore in the connector element substantially normal to the base element and positioned to be aligned with the keyhole, a latch pin extending through said bore and having a head on an inner end thereof adapted to pass through said opening, said pin fitting in said slot when the connector element is moved downwardly after the head has been moved through the keyhole opening, and means biasing the pin in the direction of the base element.

3,896,515
BOAT CONSTRUCTION

Charles E. Otterman, 440 Glorietta Blvd., Coronado, Calif. 92118

Filed June 28, 1973, Ser. No. 374,494
Int. Cl. B63c *9/06*
U.S. Cl. 9—4 R 2 Claims



1. A boat construction, comprising:

first shell defining the hull including a substantially flat submerged water contacting surface lying substantially in a single plane, side walls interconnecting with said submerged surface defining said surface as an equilateral triangle, one corner of said triangle forming the bow and the side opposite thereof the stern, wall portions of said submerged surface being recessed to form a channel extending from the bow to the stern, and said side walls being upstanding and terminating in a continuous flange;

a second shell received onto the first shell, including a molded decking and seating arrangement with a continuous flange that is coterminous with the flange on said first shell; and

a third generally dome-like means having a peripheral flange that is received on and generally coterminous with

the flanges of said first and second shells, forming an enclosure for the boat construction;

propeller and rudder means located entirely within said channel; and

means securing the flanges of said first, second and third shells to one another.

3,896,516

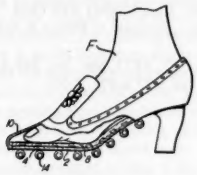
SHOE MOLDED BY INDUCTION HEATING

Elisabeth Von Den Benken, 2212 Centre St., West Roxbury, Mass. 02132

Continuation of Ser. No. 146,312, May 24, 1971, which is a division of Ser. No. 883,952, Dec. 10, 1969, Pat. No. 3,641,688. This application Mar. 29, 1973, Ser. No. 346,428

Int. Cl. A43d *9/00*

U.S. Cl. 12—142 R **2 Claims**



1. A method of shaping the bottom of a shoe according to the contour of a foot, which comprises:

joining a layer of thermoplastic material with an electromagnetic energy absorbing material;

placing the layer of thermoplastic material in the bottom area of a shoe; exposing the shoe to an alternating electromagnetic field of an induction heating machine thereby heating the layer of thermoplastic material to a temperature at which said layer becomes soft and moldable;

stepping into the shoe and pressing the foot on the bottom of the shoe thereby making an imprint of the foot in the bottom of the shoe; and

cooling the layer of thermoplastic material thereby hardening said layer and maintaining the imprint in it.

3,896,517

CONNECTING APPARATUS

Floyd E. Bigelow, Jr., 6614 Lindyann, Houston, Tex. 77008

Filed Jan. 30, 1974, Ser. No. 437,777

Int. Cl.[2] E04H *14/00;* **B65G** *11/00*

U.S. Cl. 14—71 **3 Claims**

1. A connecting corridor adapted to be connected to a building and to abut a movable vehicle comprising,

a frame connectable to a building,

said frame having spaced standards adapted to be connected to a building,

a pair of short supporting standards arranged with said spaced standards in rectangular fashion,

floor joist connecting said standards,

said floor joist extending at an outwardly and downwardly sloping angle from the spaced standards,

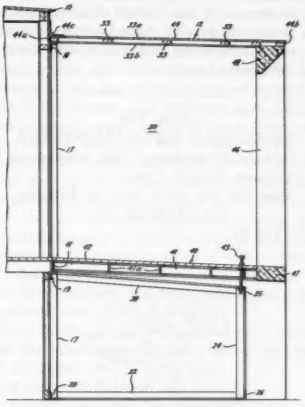
two side walls carried by the standards on opposite sides of the frame,

a roof over the frame and extending between said side walls, means for sealing between said roof and side walls and a building,

a floor supported on said floor joist,

jacking means between the floor and floor joists adjacent to said short standards for changing the angle of the floor to match the height of the floor of a vehicle adjacent the corridor,

resilient sealing means connected to the free end of the two side walls and the floor and roof,



the rectangular opening formed by the resilient sealing means on the two side walls, the floor and roof adapted to encompass the door of a movable vehicle with the wall of the vehicle sealed to the corridor by the resilient sealing means.

3,896,518

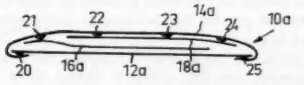
IMPREGNATED LAMINATED PAD FOR MOPS

Jan Åke Von Post, Sollentuna, and Gösta Erik Mauritz Petersson, Aneby, both of Sweden, assignors to Landstingens Inkopscentral, Solna, Sweden

Filed Mar. 16, 1973, Ser. No. 342,208

Int. Cl. A47l *13/17, 13/312*

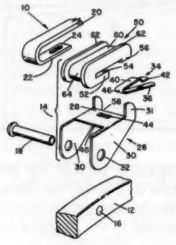
U.S. Cl. 15—104.94 **1 Claim**



1. A pad or cloth for cleaning floors comprising a rectangular pad member adapted to be fastened to a holder located at the lower end of a handle, the pad comprising first and second outer layers and at least one intermediate layer, said first outer layer which, in use, is intended to abut the floor, being comprised of a sheet of moisture permeable, wear resistant, synthetic, non-woven fiber, such as a mat of non-woven rayon, said second outer layer being comprised of a moisture impervious film of plastic material, such as polyethylene, said intermediate layer comprising cellular material, a dust binding liquid carried by said intermediate layer and adapted to be discharged through said first outer layer to floor surfaces when said floor surface and first layer are brought into contact so as to bind dust to the liquid and surface of said first layer, said second outer layer being sealed to the edges of said first layer, said intermediate layer being secured to said second layer by a number of mutually spaced, longitudinally extending glue lines at spaced transverse positions between the extremities of said intermediate layer to prevent displacement of said intermediate layer relative to said second outer layer, said intermediate layer being comprised of first and second discrete sheets, one said sheet extending from a position immediately adjacent a said marginal edge of said pad across the longitudinal center line of said pad member, the second said discrete sheet extending from the opposite marginal edge of said pad across the longitudinal center line, the width of said sheets being less than the width of said pad whereby there is defined a double

thickness of said sheets in a central area of said pad and a single thickness of said sheets adjacent said marginal edges, said longitudinally extending glue lines bonding said second outer layer to the one of said discrete sheets of said intermediate layer nearest said second outer layer to prevent relative shifting movement between said one of said discrete sheets and said second outer layer.

3,896,519
WINDSHIELD WIPER CONNECTOR
Herbert G. Pankow, Keenesburg, Colo., assignor to The Gates Rubber Company, Denver, Colo.
Filed Oct. 29, 1974, Ser. No. 518,666
Int. Cl.[2] B60S *1/40*
U.S. Cl. 15—250.32 **9 Claims**

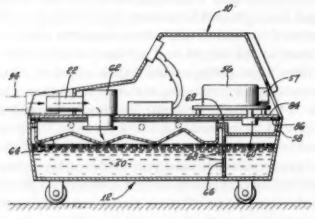


1. An assembly for connecting a windshield wiper adaptably to different sized wiper arms of the shepard's crook type, the wiper arm having an arm body and a reversely turned tip extending beneath the body, the assembly comprising:

a bracket of generally U-shaped cross-section having a bridge portion from which a pair of legs depend, said legs having means for receivably engaging a windshield wiper; an insert having an upper grooved surface for receipt of the wiper arm body and at least one inturned projection on the bottom of the insert defining an open-ended slot, said bridge portion of the bracket being securely embraced in the slot;

means carried by the bracket for locking the assembly into engagement with the reversely turned tip of the wiper arm.

3,896,520
WET AND DRY VACUUM CLEANER
William H. Williams, Palos Verdes, Calif., assignor to Spray Brite, La Mirada, Calif.
Filed Oct. 23, 1973, Ser. No. 408,920
Int. Cl. A47l *7/00*
U.S. Cl. 15—320 **4 Claims**



1. A novel vacuum cleaner comprising:

a rigid vacuum-retaining outer case, the bottom of which is adapted to serve as a liquid reservoir,

a flaccid dust-retaining container within said case,

means for creating vacuum within said case in and around said flaccid container including an inlet communicating with said case,

means communicating with said liquid reservoir for discharging liquid on a surface to be cleaned,

means communicating with said flaccid container for drawing said liquid and included dirt from said surface to be cleaned into said container under the influence of vacuum, and

baffle means within said casing for separating said flaccid container from said inlet while permitting said liquid to flow freely therethrough and round the outside of said container whereby said container can fill with used liquid at a volume rate essentially equal to the rate of depletion of the unused liquid.

3,896,521
HOME CLEANING SYSTEM
Carl Parise, Reno, Nev., assignor to Parise & Sons, Inc., Reno, Nev.
Filed Mar. 27, 1973, Ser. No. 345,417
Int. Cl.[2] A47L *7/00*
U.S. Cl. 15—321 **13 Claims**

1. A combination vacuum and hot liquid cleaner comprising:

a. a body;

b. a vacuum tank mounted in said body;

c. a hollow riser pipe mounted on the bottom of said vacuum tank and having an opening near the top thereof providing communication between the interior of the said hollow riser pipe and the interior of said vacuum tank;

d. a vacuum pump capable of operating with very humid air mounted in said body and operatively connected to the bottom of said hollow riser pipe, whereby vacuum from said vacuum pump may be communicated to the interior of said vacuum tank;

e. a hollow coupling pipe open at either end mounted in the exterior of said vacuum tank near the top thereof and projecting through the exterior thereof to provide a path of fluid communication between the interior and exterior of said vacuum tank, the opening of said coupling pipe within said vacuum tank being pointed toward the bottom of said vacuum tank, whereby vacuum from said vacuum pump may be communicated to the exterior of said vacuum tank;

f. a deflector divider removably mounted in said vacuum tank between said coupling pipe and said riser pipe and adapted to cause the foreign matter brought into said vacuum tank by the vacuum from said vacuum pump to

be dispersed initially on the bottom of said vacuum tank, thereby reducing the amount of foreign matter sucked into said pipe;

g. a diffuser cap removably attached to the top of said riser pipe and shaped to reduce the amount of foreign matter sucked into said pipe, said diffuser cap comprising

i. an inner cup-shaped member having a closed top and an opening in the wall thereof of size and shape approximately equal to the opening in said riser pipe, said opening in the wall of said inner cup-shaped member by an amount sufficient to cause said opening to overlay the opening in said riser pipe and

ii. an outer cup-shaped member having a closed top to the inner side of which the top of said inner cup-shaped member is attached and a flat exterior surface parallel to its central axis, the flat exterior surface being adapted to engage a corresponding surface on said deflector divider and being located with respect to the opening in said inner cup-shaped member such that, when it does engage a corresponding surface on said deflector divider, the opening in said inner cup-chaped member is positioned over the hole in said riser pipe;

h. means for selectively activating said vacuum pump;

i. a liquid tank mounted in said body;

j. means for heating liquid contained in said liquid tank;

k. means for selectively activating said means for heating liquid contained in said liquid tank;

l. a liquid pump mounted in said body;

m. tube means connecting the inlet of said liquid pump to said liquid tank;

n. tube means connecting the inlet of said liquid pump to the exterior of said body; and

o. means for selectively activating said liquid pump.

4. A combination vacuum and hot liquid cleaner comprising:

a. a body;

b. a vacuum tank mounted in said body;

c. a hollow riser pipe mounted on the bottom of said vacuum tank and having an opening near the top thereof providing communication between the interior of the said hollow riser pipe and the interior of said vacuum tank;

d. a vacuum pump capable of operating with very humid air mounted in said body and operatively connected to the bottom of said hollow riser pipe, whereby vacuum from said vacuum pump may be communicated to the interior of said vacuum tank;

e. a hollow coupling pipe open at either end mounted in the exterior of said vacuum tank near the top thereof and projecting through the exterior thereof to provide a path of fluid communication between the interior and exterior of said vacuum tank, the opening of said coupling pipe within said vacuum tank being pointed toward the bottom of said vacuum tank, whereby vacuum from said vacuum pump may be communicated to the exterior of said vacuum tank;

f. a diffuser cap removably attached to the top of said riser pipe and shaped to reduce the amount of foreign matter sucked into said pipe;

g. a deflector divider removably mounted in said vacuum tank between said coupling pipe and said riser pipe and adapted to cause the foreign matter brought into said vacuum tank by the vacuum from said vacuum pump to be dispersed initally on the bottom of said vacuum tank, thereby further reducing the amount of foreign matter sucked into said pipe, said deflector divider comprising

i. a divider plate in height approximately equal to the interior height of said vacuum tank, in width approximately equal to the distance from one inner wall of said vacuum tank to the opposite wall taken along a line touching the exterior of said diffuser cap on the side thereof facing towards said coupling pipe, and having apertures therein near the bottom thereof, whereby said divider substantially inhibits but does not prevent passage of foreign matter from one side to the other of said deflector divider and

ii. a deflector plate attached to said divider plate approximately perpendicularly to the surface of said divider plate on the side thereof facing towards said coupling pipe, said deflector plate being mounted at a small angle to the vertical such that it slopes away from said coupling pipe, said deflector plate being closer to a line coincident with the axis of said coupling pipe at the top than at the bottom, said deflector plate being in width approximately equal to the distance from said divider plate to the adjoining wall of said vacuum tank and extending from approximately the top of said divider plate to a short distance above the bottom of said divider plate, whereby foreign matter introduced into said vacuum tank through said coupling pipe is deflected to a segment of the bottom of said vacuum tank defined by the adjoining faces of said divider plate and said deflector plate;

h. means for selectively activating said vacuum pump;

i. a liquid tank mounted in said body;

j. means for heating liquid contained in said liquid tank;

k. means for selectively activating said means for heating liquid contained in said liquid tank;

l. a liquid pump mounted in said body;

m. tube means connecting the inlet of said liquid pump to said liquid tank;

n. tube means connecting the inlet of said liquid pump to the exterior of said body; and

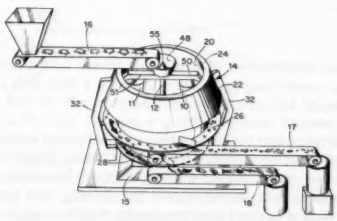
o. means for selectively activating said liquid pump.

3,896,522

APPARATUS FOR REMOVING MEAT FROM ANIMAL BONE

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed July 20, 1973, Ser. No. 381,345
Int. Cl. A22c *17/04*
U.S. Cl. 17—46 **14 Claims**



1. Apparatus for removing meat from animal bones comprising:

at least one generally cylindrical drum formed of a grid of cutting elements;

means for mounting said at least one drum for rotation about its axis at a first predetermined rate;

means for revolving said at least one drum about an axis removed from the drum axis at a second predetermined rate higher than said first rate to provide an intended centrifugal force;

means for supplying meat-containing bone to the upper end of said at least one drum;

means for removing meat from the outer portion of the grid of said at least one drum; and

means for collecting bones from the lower end of said at least one drum.

13. A substantially continuous method for removing meat from animal bones comprising the steps of:

moving a grid of cutting elements along a predetermined continuous closed path to provide unidirectional rotation about its axis;

revolving said grid of cutting elements about an axis removed from said grid axis to produce an intended centrifugal force;

supplying meat-containing bone to said grid of cutting elements to cause relative movement between said meat-containing bone and said grid and engagement of said cutting elements therewith;

removing meat from an outer portion of said grid; and

removing bone from an inner portion of said grid.

3,896,523

DEVICE FOR FEEDING FIBROUS MATERIAL, ESPECIALLY SPINNING MATERIAL, TO A PROCESSING MACHINE

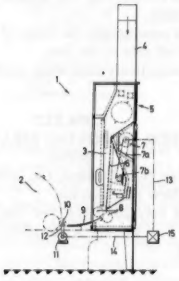
Guntram Beukert, Dulmen, Germany, assignor to Hergeth KG Maschinenfabrik und Apparatebau, Dulmen, Germany

Filed May 22, 1973, Ser. No. 362,686

Claims priority, application Germany, June 16, 1972, 2229438

Int. Cl. D01g *15/40*

U.S. Cl. 19—105 **3 Claims**



1. The combination of a feeding device and a processing machine comprising first means defining a first path of travel for material between input and output ends of said feeding device, second means defining a second path of travel for material from said feeding device output end to an input end of said processing machine, conveying means at said processing machine input end for feeding material into said processing machine, first motor means for driving said conveying means, means beyond said processing machine input end for processing material therein, means for shaking said material as it moves along said first path, second motor means for driving said shaking means, means for directly controlling the speed of operation of said shaking means proportionally to the speed of operation of said conveying means, and said controlling means include electrical regulating means coupled between said first and second motor means for increasing and decreasing the speed of said second motor means in response to respective increasing and decreasing speed of said first motor means.

3,896,524

BUNDLE BINDING STRAP

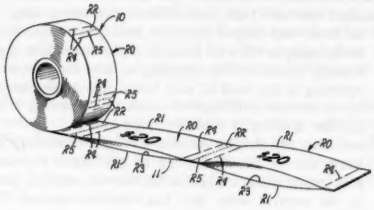
Warren D. Parker, 3525 University Ave., Bakersfield, Calif. 93306

Filed Apr. 22, 1974, Ser. No. 462,627

Int. Cl. B65d *63/00*

U.S. Cl. 24—17 B **7 Claims**

1. A currency bundle binding strap comprising a pair of elongated band segments of flexible sheet material having opposite ends, corresponding ends of the segments being bonded flatly against each other to define a currency receiving opening therebetween and between the segments and said



bonded ends of the segments forming tabs endwardly extended from the segments.

3,896,525

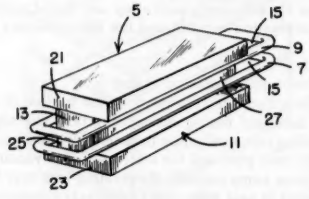
FLOATING STRAP BUCKLE

Alfred H. Stewart, Jr., Media, Pa., and Edmond W. Palmer, Jr., Moorestown, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Apr. 17, 1974, Ser. No. 461,552

Int. Cl.² B65D *63/06;* **A44B** *11/00*

U.S. Cl. 24—21 **10 Claims**



1. A buckle for use in connecting the opposite ends of a binding strap including a pair of superposed rings about and between which bight portions of a strap may be disposed to grip the same and a float which is buoyant in water and which includes a member extending freely through the ring openings, so as to be encircled by said rings, said member serving to maintain such rings in superposed relationship while permitting limited movement thereof relative to each other and said member, and retainers connected to said member for maintaining said rings captive on said member.

3,896,526

FRICTION BINDER HAVING VARIABLE CLAMPING FORCES

Thomas R. Joiner, Los Altos, Calif., assignor to Plan Hold Corporation, Irvine, Calif.

Filed Dec. 26, 1973, Ser. No. 427,692

Int. Cl.² B42F *1/00;* **A47F** *5/08*

U.S. Cl. 24—67.1 **18 Claims**

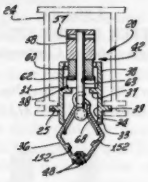
1. In a device for vertical filing of sheet material in which an inverted generally U-shaped channel provides longitudinal edges bearing against longitudinally extending clamp members hinged together within the U-shaped channel, the provision of:

means to apply a variable force to said clamp members to move the clamp members into closed position to secure one or more of said sheets of material,

said force applying means drawing the clamp members

further into said channel member,

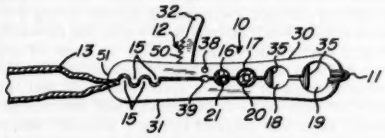
said force applying means including yieldable resilient means for transmitting a variable pressure force responsive to the number of sheets to be held.



3,896,527
UNITARY CLAMP

Gale W. Miller, and James L. Geraci, both of Cincinnati, Ohio, assignors to Cincinnati Biomedical, Inc., Cincinnati, Ohio

Filed May 23, 1973, Ser. No. 363,034
Int. Cl. A44b *21/00*
U.S. Cl. 24—81 HS **14 Claims**



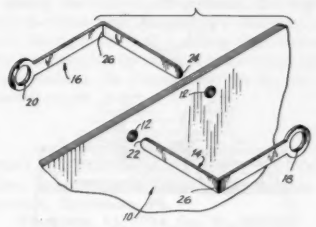
1. A one-piece, plastic clamp for clamping tubing and the like to a support member, comprising a pair of elongate jaws integrally hinged together at one of their ends of pivotal movement to open and closed positions, one of said jaws having an opening therethrough between the ends thereof and spaced from the hinged end, a latch strike on said one jaw at one side of said opening, an upstanding latch member on the other jaw spaced from the hinged end thereof in a position to extend through the opening in said one jaw and having serrations on one side thereof engageable with the latch strike to releasably latch the jaws in closed position, a plurality of transverse arcuate channels in each jaw between the latch and hinged end thereof and extending completely across the width of the jaws, said channels forming a plurality of transverse through-passageways in the clamp when the jaws thereof are disposed in closed juxtaposition for clamping tubing and the like between the jaws, and an upstanding guide post on one of said jaws at the side of at least one of said channels and projecting into said channel to engage the side of a tube therein to guide the tube into proper registry with the channel during closing movement of the jaws and to lock the tube in proper position in the channel when the jaws are in closed juxtaposition.

3,896,528
FASTENER

Rodman Abeles, 305 E. 40th St., New York, N.Y. 10016

Filed Feb. 15, 1974, Ser. No. 443,148
Int. Cl.[2] A44B *9/00;* **B42F** *3/00*
U.S. Cl. 24—153 S **4 Claims**

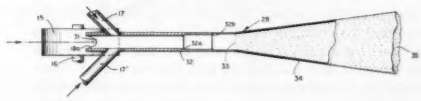
1. In combination, a fastener adapted for holding together a stacked plurality of sheet material, such as paper and the like, the combination comprising: a pair of elongated, substantially flat elements, each of said elements having at one end thereof passage means; said passage means of said elements adapted to be aligned from opposite sides of the stacked sheet material with spaced apart openings in said sheet material; the other end of each of said elements being folded and adapted to pass in opposite directions through said spaced apart openings and the passage means of the opposing element; and said ends being further folded, whereby the interlocking of the other end of each element with the passage means of the opposing element forms together with said stacked sheet material a reinforced rigid edge portion between at least said pair of spaced apart openings.



3,896,529
STRAND TREATMENT APPARATUS

Robert K. Stanley, Media, Pa., assignor to Textured Yarn Co., Inc., Kennett Square, Pa.

Continuation-in-part of Ser. Nos. 343,644, March 22, 1973, Pat. No. 3,840,950, and Ser. No. 376,890, July 5, 1973, which is a continuation-in-part of Ser. No. 343,644, and Ser. No. 124,213, March 15, 1971, Pat. No. 3,753,275, which is a continuation-in-part of Ser. No. 822,429, May 7, 1969, Pat. No. 3,570,083, which is a continuation-in-part of Ser. No. 678,428, Oct. 26, 1967, Pat. No. 3,462,814, and Ser. No. 302,758, July 31, 1963, Pat. No. 3,376,622. This application Oct. 11, 1973, Ser. No. 405,262
Int. Cl. D02g *1/12*
U.S. Cl. 28—1.6 **2 Claims**



1. In stuffer-crimping apparatus for textile strands, having a laterally confining stuffing chamber with open outlet end and nip-roll means for feeding strand thereinto and jet means for forwarding it at least partially therethrough the improvement comprising an outwardly flaring circumferential screen constituting a terminal portion of the chamber.

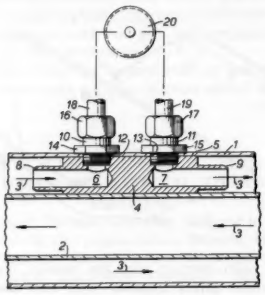
3,896,530
APPARATUS FOR HEATING TEXTILE YARNS AND FILAMENTS

Denis Albert Edward Mattingly, 5 Farorna Walk, Enfield, Middlesex, England

Filed Nov. 16, 1973, Ser. No. 416,600
Int. Cl. D02j *13/00, 1/22*
U.S. Cl. 28—71.3 **9 Claims**

1. Apparatus for heating textile yarns and filaments comprising an elongate conduit through which a heating fluid is arranged to be passed in use; a first tubular member defining a first passageway having an end projecting into the conduit and facing, within the conduit, against the direction of flow of the fluid; a second tubular member defining a second passageway having an end projecting into the conduit and facing, within the conduit, with the direction of flow of the fluid; and a hollow yarn heating device connected to the first and second passageways outside the conduit whereby to permit in use the flow of heating fluid from the conduit through the first pas-

sageway, the heating device and the second passageway back into the conduit, said first tubular member being smaller than



said conduit and arranged to permit flow therein of only a part of fluid flowing in said conduit.

3,896,531

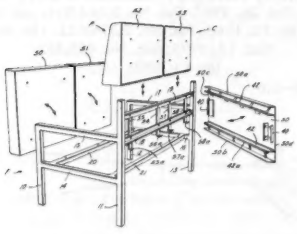
UPHOLSTERY SYSTEM METHOD AND APPARATUS

DeWitt Y. Gorman, P.O. Box 26323, Houston, Tex. 77032

Filed July 26, 1973, Ser. No. 382,702

Int. Cl. B24b *39/00*

U.S. Cl. 29—91.1 **3 Claims**



1. A method of releasably securing a sheet of unformed decorative upholstery covering material to a base member having a cushion portion to form an upholstered cushion, including the steps of:

providing a cushion portion for a base member in a desired shape with the cushion portion forming at least one cushion corner;

arranging the sheet of unformed decorative upholstery covering material by positioning the sheet of unformed decorative upholstery covering material about the cushion portion in a desired manner;

folding the sheet of unformed decorative upholstery covering material at each cushion corner formed by the cushion portion in a manner for forming a sheet of folded decorative upholstery covering material about the cushion portion in a desired manner for viewing;

placing a shield member within a fold to eliminate wrinkles formed in the viewed surface of the sheet of upholstery covering material by the portion of the sheet of upholstery covering folded behind said viewed surface of the sheet of upholstery covering; and

deforming resiliently by engaging with the base member a plurality of clip members also engaging the sheet of folded decorative upholstery covering material without the use of tools for providing a plurality of forces for releasably securing the folded sheet of decorative upholstery covering material with the base member while avoiding piercing or damaging of the sheet of unformed decorative upholstery covering material.

3,896,532

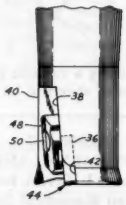
CUTTER INSERT SPINDLE

Norman Darrell Brooks, 6410 Centennial Dr., Toledo, Ohio 43613

Filed Nov. 30, 1973, Ser. No. 420,385

Int. Cl.² B26D *1//12*

U.S. Cl. 29—105 R **5 Claims**



1. A milling cutter for a profile duplicating machine and the like, comprising: a milling cutter body having an intermediate generally cylindrical portion with a centrally located axis of rotation extending therethrough, an upper end chucking portion, and an enlarged lower end tip portion having a sloping bottom surface which extends downwardly and outwardly and having a lateral side surface forming an angle of approximately 60° with said sloping bottom surface, said side surface forming an angle of between approximately 8° and approximately 30° with said axis of rotation, said intermediate and enlarged lower end portions having a generally triangularly shaped pocket therein with the sides of one apex thereof being generally coincident with said bottom and side surface of said tip portion, said pocket having a bottom surface for supporting a generally triangularly shaped cutter with edges of one apex of the cutter generally coincident with said apex of said pocket, said bottom sloping outwardly at an angle between 3° and 12° from the diametral plane when proceeding longitudinally upwardly with respect to said axis of rotation, said bottom of said pocket being constructed and arranged to support the top edge of the insert above said diametral plane, and clamp means for holding the cutter insert in said pocket.

3,896,533

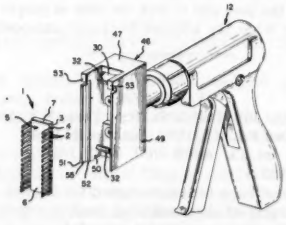
TOOL FOR INSERTING AND REMOVING CIRCUIT COMPONENTS

Robert Ullman, Harrisburg, and Earl William Wagner, Annville, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed July 10, 1974, Ser. No. 487,340

Int. Cl. H05k *3/32*

U.S. Cl. 29—203 B **5 Claims**



1. An inserting and removing tool for circuit devices of the type comprising a body having leads extending from a first pair of parallel sides, said leads extending in one direction substantially normally of the plane of said body and being

arranged in two rows, said body having a second pair of sides which extend between said first pair of sides, said leads being insertible into aligned receptacles in a printed circuit board or the like, said tool comprising:

a tool head having an open side and having too opposed sidewalls which are spaced apart by a distance which is substantially equal to the spacing between said rows, said side-walls having free ends which define said open side of said head,

a pair of opposed gripping arms between said sidewalls, said arms having free ends, said free ends being spaced apart by a distance which is always equal to at least the distance between said second pair of sides of said circuit device, actuator means for moving said arms between an extended position through an intermediate position to a retracted position in said head, said free ends of said arms being proximate to said free ends of said sidewalls when said arms are in said extended position, said free ends of said arms being remote from said free ends of said sidewalls when said arms are in said retracted position,

arm closing means, said closing means being effective to move said free ends of said arms relatively towards each other during movement of said arms from said extended position to said intermediate position,

spaced apart end walls extending transversely to and between said sidewalls, said arm closing means comprising opposed surface portions of said end walls, said opposed surface portions being cooperable with said arms to move said free ends of said arms towards each other upon movement of said arms from said extended position to said intermediate position whereby,

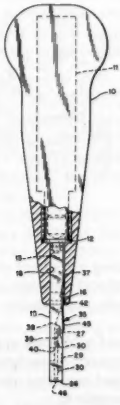
a circuit device can be gripped between said arms for the purpose of removing said leads from said aligned receptacles by moving said arms to extended position and locating said device with said second pair of sides between said arms, subsequently moving said arms to said intermediate position so that device is gripped between said arms, and upon subsequent movement of said arms to said retracted position, said device is moved into said tool head.

3,896,534

ELECTRICAL WIRE INSERTING TOOL

Harry Kaufman, New Rochelle, N.Y., and Myron K. Gordin, Oskaloosa, Iowa, assignors to O.K. Machine and Tool Corporation, New York, N.Y.

Filed Dec. 16, 1974, Ser. No. 533,284
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—203 HC **9 Claims**



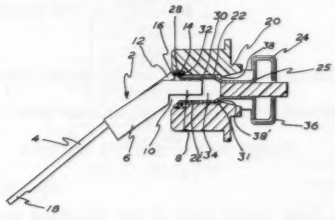
1. In a wire inserting tool comprising a housing, an impulse generator within the housing, and a working blade having one end proximal to the impulse generator to receive an impulse and an opposite end distal from the impulse generator and projecting from the housing and having a recess for accommodating a wire-receiving terminal which blade serves for severing and seating the wire in the terminal, the improvement comprising the blade distal end having a channel, a separable tip member having at one end a cutting edge, and means for removably mounting the tip member to the blade at the channel to form between the channel and the tip the terminal-accomodating recess.

3,896,535

CONTACT TERMINAL EXTRACTION TOOL

John James Tucci, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 13, 1974, Ser. No. 505,809
Int. Cl. H01r *43/00*
U.S. Cl. 29—206 **4 Claims**



1. A tool for extracting and inserting individual terminals from multi-contact connector housings, said tool comprising:

a bar with first and second ends,

guide support means, proximate to said first end and fixed to said bar, said bar extending across one surface of said guide support means, said surface defining the top of said guide support means and the top of said tool,

guide arm means extending from said support means on the end of said guide support means nearest said first end of said bar, said first end protruding slightly above said arm, notch means on said first end of said bar, whereby upon positioning said guide arm means against an appropriate surface on said connector housing and engaging said notch means against one end of a terminal in said connector, said terminal can first be freed from its normally secured position in the connector and can then be pushed partially from the housing.

3,896,536

ORIENTER FOR WOOD STRANDS

Harold A. Keller, Clarkston, Wash., and Robert J. Saunders, Lewiston, Idaho, assignors to Potlatch Corporation, San Francisco, Calif.

Filed July 10, 1974, Ser. No. 486,987
Int. Cl. B23q *7/10*
U.S. Cl. 29—211 R **17 Claims**

1. A device for orienting elongated wood strands and for forming an oriented layer of said strands across the transverse width of a caul surface preparatory to production of a reconstituted wood product, said strands each presenting a nominal length greater than its width and being oriented in a prescribed direction along the transverse width of said caul, said device comprising:

a source of strands;

said caul surface being located below said source of strands;

a cylindrical drum interposed between the source of strands and the caul surface and having an axial width substantially equal to the transverse caul surface width;

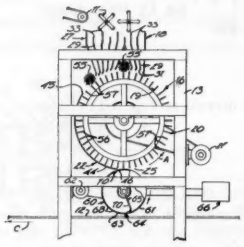
said cylindrical drum being rotatably mounted about a central drum axis parallel to the caul surface, said drum

having an outer peripheral surface extending continuously across the width of the caul surface;

drive means operatively connected to said drum for imparting to the drum rotational motion in a prescribed angular direction about the central drum axis;

delivery means for receiving strands from the source and for directing a substantially-uniform array of strands onto the rotating drum peripheral surface at a loading station located between said drum and said delivery means at a first angular position with respect to the central drum axis;

strand orienting fins on said drum, said fins including a plurality of adjacent fin surfaces facing one another in pairs, said fin surfaces being located across the drum width and extending outwardly to outer fin edges, said



fins being spaced apart at said peripheral surface by distances less than the nominal strand length, whereby strands directed onto the drum peripheral surface between said fins are oriented substantially parallel to one another by contact with the fin surfaces; and

means for confining the strands within a plurality of spaces on the drum, each space being bounded by the drum peripheral surface and a pair of said fin surfaces, as the strands are moved about said rotational path to a discharge station at a second angular position displaced about the central drum axis from said first angular position, and for releasing the strands to fall gravitationally onto the caul surface at said discharge station;

said caul surface and central drum axis being movable relative to one another to enable an elongated layer of oriented strands to be formed on the caul surface.

9. A device for orienting elongated wood strands each having a nominal length greater than its width and for forming a layer of directionally-oriented strands on a caul surface preparatory to production of a reconstituted wood product, comprising:

a source of strands;

a receiving caul surface having a prescribed transverse width located below said source of strands;

a first drum interposed between the source of strands and the caul surface having an axial width substantially equal to the width of the caul surface;

said first drum being rotatably mounted about a first central drum axis parallel to the caul surface, said first drum having an outer peripheral surface extending continuously across the width of said caul surface;

first drive means operatively connected to said first drum for imparting to the first drum rotational motion in a prescribed angular direction about the first central drum axis;

delivery means for receiving strands from the source and for directing a substantially uniform array of strands onto the rotating first drum peripheral surface at a loading station between said first drum and said delivery means at a first angular position with respect to said first central drum axis;

strand orienting fins on said first drum, said fins including a plurality of adjacent fin surfaces facing one another in pairs, said fin surfaces being located across the drum width and extending outwardly from the peripheral surface to outer fin edges, said fins being spaced apart at said peripheral surface by distances less than the nominal strand length, whereby strands directed onto the peripheral surface between the fins are oriented substantially parallel to one another by contact with the fin surfaces;

first means for confining the strands within a plurality of spaces on the first drum, each space being bounded by the peripheral surface of the drum and a pair of said fins, as the strands are moved about the rotational path from said loading station to a discharge station at a second position displaced about the first central drum axis from said first angular position and for releasing said strands at the discharge station to fall gravitationally from between said fins;

a second drum located between said first drum and caul surface for rotation about a second central drum axis parallel to the first central drum axis, said second drum having a peripheral surface thereon coaxial with said second central drum axis and extending continuously across the width of the caul surface;

second drive means operatively connected to said second drum for imparting to said second drum rotational motion about the second central drum axis in a direction of rotation opposite to that of said first drum;

strand transfer means on said second drum for receiving strands at said discharge station from said first drum and for moving said strands therefrom about said second central axis to an angular displaced final discharge station adjacent said caul surface where said strands are released to fall gravitationally onto said caul surface;

second means for confining the strands on said transfer means as they are moved therewith from said discharge station to said final discharge station; and

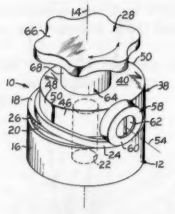
said caul surface and said second central drum axis being movable relative to one another so an elongated layer of oriented strands may be formed on the caul surface.

3,896,537

TOOL FOR INSTALLING RESILIENT RINGS ON CYLINDRICAL MEMBERS

William H. Freeman, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 26, 1973, Ser. No. 428,091
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—235 **9 Claims**



9. A tool, for installing a resilient seal ring within a peripheral groove in a cylindrical member, comprising;

a tool body endwardly positionable against such cylindrical member;

a cam surface on said tool body engageable with a portion of the inner periphery of such seal ring for positioning said portion of said seal ring peripherally outwardly of said cylindrical member;

an arcuate relief surface on said tool body forming a continuation of said cam surface to contain an adjacent portion of said seal ring in a pre-cam engaging position endwardly

against said cylindrical member in a substantially relaxed nonexpanded condition; and

a thrust member on said tool body in edgewardly peripherally overlapping relation to said cylindrical member for movement in an arcuate path upon rotation of said tool body in trailing relation to said cam surface for progressively depressably sliding said portion of said seal ring peripherally onto said cylindrical member and for guiding a trailing portion of said seal ring into said peripheral groove.

3,896,538

PULL TAB FOR CAM LOCK SLIDERS

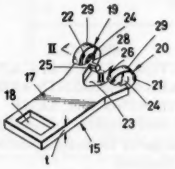
Hirokazu Watanabe, Toyama, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 426,666, Dec. 12, 1973. This application July 25, 1974, Ser. No. 491,809

Claims priority, application Japan, Dec. 14, 1972, 47-125428

Int. Cl. B21d *53/54*

U.S. Cl. 29—409 **1 Claim**



1. A method of making a pull tab for slide fastener sliders which comprises the steps of:

a. swaging a tab forming blank adjacent one end to produce a pair of laterally extending ear portions of reduced thickness;

b. erecting said ear portions so as to project perpendicularly beyond the upper surface of said blank;

c. stamping out said blank to form a polygonal opening adjacent said one end and between said ear portions, resulting in bifurcated tongue portions extending on opposite sides of said opening and now having said ear portions at their respective outer edges, and in inwardly directed opposed trunnions by which the pull tab is connected pivotally to a slider; and

d. bending each of said tongues over backward around said erected ear portion substantially into the form of a roll serving as a cam roll, with said ear portion being held in intimate contact with the inner peripheral surfaces of said tongue.

3,896,539

METHODS FOR ASSEMBLING WASHER MEMBERS WITH ROTARY FASTENER MEMBERS

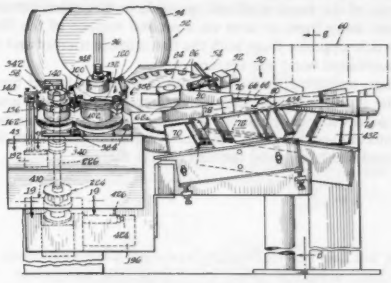
Henry Pomernacki, Northbrook, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 88,942, Nov. 12, 1970, Pat. No. 3,750,206. This application May 25, 1973, Ser. No. 363,842

Int. Cl.² B23P *19/08*

U.S. Cl. 29—430 **12 Claims**

1. The method of assembling rotary fastener members with washer members which comprises feeding a mass of washer members along a given path, cascading washer members from said path downwardly into association with a plurality of washer accommodating pockets moving along an inclined circular path, removing unaccommodated washer members from said circular path, feeding rotary fastener members having a washer receiving shank along a different path into juxtaposition and alignment with washer members from said circular path, telescopically assembling said members, swaging said rotary fastener members to secure washer members against dislodgement therefrom and recirculating unaccommodated washer members along a predetermined path to said first mentioned path.



3,896,540

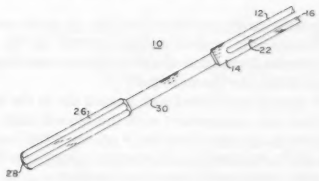
METHOD OF INSERTING SPRING-LOADED BALL AGAINST DETENT

Joseph R. Ellis, 4307 Patton Rd., Apt. 15, Huntsville, Ala. 35805

Filed Dec. 17, 1973, Ser. No. 425,632

Int. Cl. B23q *3/00*

U.S. Cl. 29—468 **1 Claim**



1. The process for installing a ball against the lower end of a spring in a vertical well, which combination of spring and ball are adapted to latch at selected positions a pivoted sector member having at least one cooperating socket, which comprises:

providing a tool including an elongated rod having at one end a curved, ovular cavity approximating the contour of said ball and an elongated slot extending from said one end;

placing the ball in said curved cavity and with the sector member turned out of engagement with and clear of said spring, positioning said tool so that said ball is held up against said spring;

while so holding said ball, rotating said sector member through said slot until said ball rests and is supported by a socket of said sector member and;

removing said tool after said sector engages and holds said ball.

3,896,541

METHOD AND APPARATUS FOR SUPPORTING SUBSTRATES DURING BONDING

Stanley Golinski, La Grange Park, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,645

Int. Cl.² B23K *19/00, 37/04;* **H01L** *21/603*

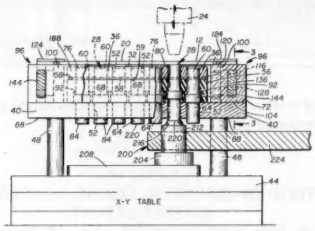
U.S. Cl. 228—180 **12 Claims**

1. In an apparatus for supporting a first article, which is moved to sequentially position selected bond sites on a first

surface thereof at a bonding location, during bonding of second articles to the bond sites at the bonding location:

a plurality of supports, each associated with an individual one of the bond sites and movable in directions toward and away from an area on a second surface of the first article opposite from both the first surface thereof and its associated bond site thereon, and

means, operative upon the positioning of a selected bond site at the bonding location, for moving the support associated with that bond site toward the second surface and into engagement with the area thereof opposite from the bond site to support the first article thereat.



9. In a method of supporting a first article, which is moved to sequentially position individual ones of a plurality of bond sites on a first surface thereof at a bonding location, during the bonding of second articles to the bond sites at the bonding location:

positioning individual ones of a plurality of supports in a spaced relationship with a second surface of the first article opposite from both the first surface and from an associated bond site thereon, and

moving the support associated with a bond site at the bonding location into engagement with the second surface of the first article opposite from the bond site at the bonding location while maintaining the remaining supports in the spaced relationship with the second surface.

3,896,542

METHOD OF SEALING ELECTRICAL COMPONENT ENVELOPES

John Robert Dale, Salfords, near Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 20, 1973, Ser. No. 352,872

Claims priority, application United Kingdom, May 3, 1972, 20688/72

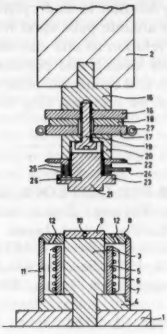
Int. Cl. B23k *35/12*

U.S. Cl. 228—234 **18 Claims**

1. A method of forming a bond between and sealing together facing substantially flat peripheral metal surfaces of a semiconductor enclosure via an intermediate layer of malleable metal material, said bond having a bond tensile strength of approximately 20 percent or more of the Ultimate Tensile Strength of said intermediate layer, comprising the steps of:

positioning a layer of malleable metal material between said facing substantially flat peripheral metal surfaces; and

pressing said facing metal surfaces together at a pressure normal to said surfaces of between 1 to 5 tons per square inch at an elevated temperature below the melting point of said malleable metal layer at said pressure and suitably close to but below the lowest temperature at which a liquid phase forms at said pressure between said malleable layer and one of said metal surfaces, said pressing being maintained at said elevated temperature for a period sufficient to achieve sealing between said facing metal surfaces and a bond having a bond tensile strength of approximately 20 percent or more of the Ultimate Tensile Strength of said malleable metal material, the maximum period required for such sealing and bonding being 30 seconds and the maximum required reduction in



thickness of said malleable layer resulting therefrom being 5 percent.

3,896,543

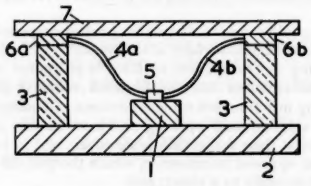
SEMICONDUCTOR DEVICE ENCAPSULATION PACKAGES AND ARRANGEMENTS AND METHODS OF FORMING THE SAME

David John Colliver, and Stephen Edwin Gibbs, both of Malvern, England, assignors to British Secretary of State for Defence, London, England

Division of Ser. No. 253,036, May 15, 1972, abandoned. This application July 23, 1973, Ser. No. 381,657

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—580 **5 Claims**



1. A method of encapsulating a high frequency semiconductor device comprising the steps of (*a*) depositing on a piece of conducting material a glass of a kind which is convertible by controlled heat treatment to form a glass-ceramic, (*b*) converting said glass into a glass-ceramic layer of uniform thickness by a controlled heat treatment thereof which comprises heating said glass to the nucleation temperature at which crystal nucleation thereof begins, maintaining said glass at said nucleation temperature for a period of time, heating said glass further to the maximum temperature at which crystallization thereof occurs, maintaining said glass at said maximum crystallization temperature for a period of time, and slowly cooling said glass to produce said glass-ceramic layer consisting of a two-phase medium of a uniformly distributed ceramic mass embedded within a glass binding medium, (*c*) depositing a layer of resist material on said glass-ceramic layer, (*d*) depositing a mask on said layer of resist material, (*e*) changing the solubility of parts of said layer of resist material by exposing said layer of resist material to a solubilitychanging radiation through said mask, (*f*) dissolving away the soluble regions of said resist, (*g*) chemically etching said layer of glass-ceramic through said dissolved away regions to form a plurality of glass-ceramic posts on said piece of conducting material, (*h*) mounting at least one semiconductor device on said conduct-

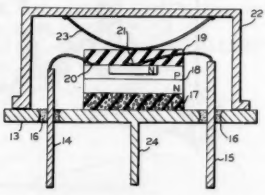
ing material at positions adjacent each of said posts, and (*i*) electrically connecting the parts of said semiconductor devices remote from said conducting material to said posts.

3,896,544

METHOD OF MAKING RESILIENT ELECTRICAL CONTACT ASSEMBLY FOR SEMICONDUCTOR DEVICES

Robert D. Fosnough, Logansport, Ind., assignor to Essex International, Inc., Fort Wayne, Ind.

Division of Ser. No. 323,991, Jan. 15, 1973, abandoned. This application Feb. 4, 1974, Ser. No. 439,366
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—588 **4 Claims**



2. A method of making a transistor assembly having a semiconductor chip with emitter, collector and base contact areas, a case member through which contact is made to the emitter and base contact areas of the semiconductor chip and to which said collector contact area is electrically and thermally connected, and a cap attached to said case member to enclose said semiconductor chip, comprising the steps of:

positioning a preformed resilient elastomeric compressible pad of substantially uniform thickness throughout in abutting unbonded contact with said case member and said collector contact area to electrically and thermally connect said case member with said collector contact area, said pad containing a plurality of electrically and thermally conductive particles dispersed therethrough, said particles engaging one another to establish electrically and thermally conductive paths through said pad to render it electrically and thermally conductive;

Compressing said pad to maintain electrical and thermal contact between said collector contact area and said case member;

making electrical connections to said emitter and base contact areas; and

attaching said cap member to said case member to enclose said semiconductor chip.

3,896,545

METHOD OF MAKING A MOLDED WAVEGUIDE FILTER WITH INTEGRAL TUNING POSTS

William L. MacTurk, Claremont, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Continuation-in-part of Ser. No. 406,058, Oct. 12, 1973, abandoned. This application Aug. 5, 1974, Ser. No. 494,693
Int. Cl.[2] H01P *11/00*
U.S. Cl. 29—600 **15 Claims**

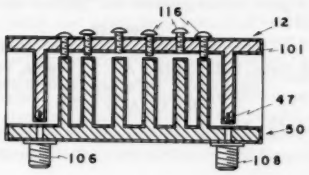
1. A method of producing a waveguide filter having integral tuning posts comprising the steps of:

molding a substantially U-shaped waveguide filter body having integral tuning posts disposed therein, said integral tuning posts being shorter than the walls of said U-shaped waveguide filter body;

molding a substantially flat waveguide filter cap for the molded waveguide filter body to substantially close the open end of said substantially U-shaped waveguide filter body;

copper plating the waveguide filter body and the waveguide filter cap;

gold plating the copper-plated waveguide filter body and the copper-plated waveguide filter cap;



assembling the plated waveguide filter cap and the plated waveguide filter body to form the waveguide filter; and

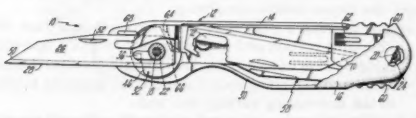
providing adjustable metal tuning screws in said waveguide filter cap to extend over the integral tuning posts of said waveguide filter body.

3,896,546

FOLDING KNIFE AND REPLACEABLE BLADE THEREFOR

William John Hildebrandt, West Simsbury, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Aug. 27, 1973, Ser. No. 391,604
Int. Cl. B26b *1/02, 5/00*
U.S. Cl. 30—157 **8 Claims**



1. In a folding knife having a handle, a pivot on the handle and a replaceable blade including a cutting edge, said blade being mounted on the pivot for pivotal movement through an arc of about 180° between a folded position with the cutting edge housed within the handle and an extended position with the cutting edge exposed, the combination comprising a blade carrier mounted on the pivot and having blade locking means thereon preventing relative rotation between the blade and the carrier whereby the blade and the carrier rotatably move as a unit between said folded and extended positions, said carrier being enclosed within the handle and movable between said positions in response to movement of said blade, said blade having mounting means cooperating with said pivot for pivotably mounting the blade, said mounting means including means asymmetric to said pivot and adapted to cooperate with said blade locking means to mount said blade for pivotal movement of said locking means and said blade as a unit and to prevent reversible mounting of the blade on the carrier.

3,896,547

PROSTHETIC ARTICLE AND METHOD FOR MANUFACTURE

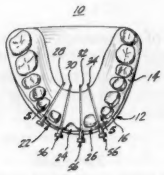
Leonard Kulwiec, Santa Rosa, Calif., assignor to Sterndent Corporation, Mt. Vernon, N.Y.

Filed May 2, 1974, Ser. No. 466,167
Int. Cl. A61c *13/00*
U.S. Cl. 32—10 A **13 Claims**

1. An article comprising a solid alloy comprising from about 12–20 percent chromium, from about 7–12 percent cobalt, from about 1.5–5 percent of at least one element selected from molybdenum, tungsten, columbium and tantalum, from about 5–9 percent of at least one element selected from aluminum and titanium, from about 0.05–0.2 percent carbon, from about 0.005–0.1 percent boron, from about 0.05–0.2 percent

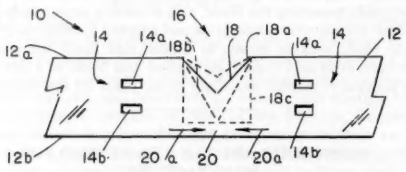
of at least one element selected from zirconium and hafnium and the balance nickel which is shaped to conform with the shape of bony tissue of a living animal and for attachment to said bony tissue.

3,896,548
DENTAL MODEL CONSTRUCTION
Eric H. Zahn, 1622 Eastlake Ave. E., Seattle, Wash. 98109
Filed Feb. 4, 1974, Ser. No. 438,998
Int. Cl. A61c *13/00*
U.S. Cl. 32—11 **5 Claims**



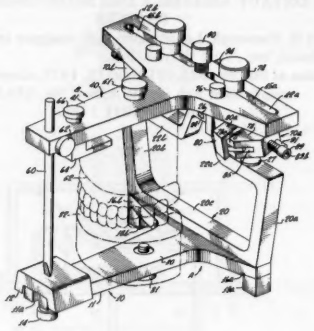
1. In a dental model in which a reproduction of tooth and jaw structure of a patient is mounted on a base, and at least one portion of said reproduction is dowelled to and separable from the base and from laterally contiguous non-separable portions of said reproduction by reason of intervening parting lines, the improvement comprising:
   means forming a pair of opposed recesses in a face of a separable portion and the juxtaposed face of a non-separable portion of said reproduction, said recesses defining an inward extending socket disposed in spanning relation to the intervening parting line; and
   a pin fitted to said socket and cooperable with said recesses to prevent separation of said separable portion from the base.

3,896,549
ORTHODONTIC ELASTIC BAND
Melvin Wallshein, 8645 Bay Pky., Brooklyn, N.Y. 11214
Filed Apr. 22, 1974, Ser. No. 462,658. The portion of the term of this patent subsequent to Apr. 16, 1991, has been disclaimed.
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 A **26 Claims**



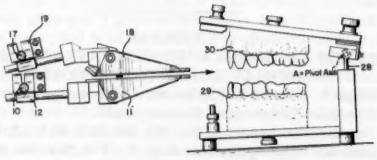
1. An orthodontic elastic band for use with orthodontic arch brackets mounted on teeth misaligned from their desired positions, the band comprising a plurality of spaced sections each provided with bracket engaging means for substantially non-rotatably engaging a respective bracket; and elastic connecting means coupling adjacent sections together, said elastic connecting means being located with respect to said adjacent sections and dimensioned for generating and applying generally rotational forces to said adjacent sections and their respective brackets when said connecting means are elastically tensioned.

3,896,550
JAW MOVEMENT SIMULATOR
Robert L. Lee, 22937 Grand Terrace Rd., Colton, Calif. 92324
Filed Sept. 17, 1973, Ser. No. 397,946
Int. Cl. A61c *11/00*
U.S. Cl. 32—32 **27 Claims**



1. An instrument for simulating human jaw movements including:
   a mandibular frame;
   means on said frame to define an axis that simulates the hinge axis of a human mandible;
   a maxillary frame; and
   guide means on said maxillary frame cooperating with the mandibular frame to permit rotational movement of the mandibular frame on the maxillary frame about said axis and controlled and limited sliding movement of said axis while simulating right and left jaw movement and preventing direct lateral shifting of the axis means when the frames simulate protrusive movements, said guide means being formed to permit smooth transitional movement from a protrusive position into a right or left lateral position.

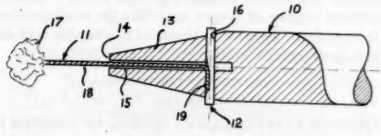
3,896,551
METHOD OF TRANSFERRING AXIS-ORBITAL PLANE INFORMATION FROM A PATIENT TO A DENTAL ARTICULATOR
Charles E. Stuart, P.O. Box 1298, Ventura, Calif. 93001
Filed Nov. 15, 1973, Ser. No. 416,018
Int. Cl.² A61c *11/00*
U.S. Cl. 32—32 **1 Claim**



1. A method of transferring axis-orbital plane information with a dental mandibular movement recorder to a dental articulator wherein plaster casts of a patient's lower and upper teeth have been made and are mounted on the articulator with an axis orbital transferring device and centric relation recording, comprising the steps of:
   a. providing lower and upper reference plates coupled to the recorder in place of the usual clutches;
   b. lining the reference plates with impression taking material;

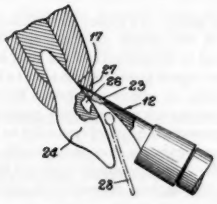
c. inserting the reference plates in the patient's mouth holding his mandible in a centric position;
d. adjusting the various recording stylii and recording surfaces of the recorder;
e. holding the adjustment until the impression material has hardened;
f. making the various recording traces by the recorder; and,
g. transferring the hardened indents in the reference plates to the casts on the articulator so that the recorder is positioned on the articulator with correct axis-orbital plane relationship automatically established as a consequence of the casts fitting properly in the hardened impression material.

3,896,552
DENTAL INSTRUMENT
John R. Russell, Walnut Creek, Calif., assignor to E-Z Floss, Palm Springs, Calif.
Filed Mar. 18, 1974, Ser. No. 452,210
Int. Cl. A61c *5/12*
U.S. Cl. 32—34 **4 Claims**



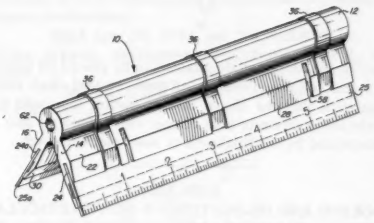
1. An instrument useful for contacting surfaces with soft material comprising an elongated handle having an axial hole in the end thereof and a transverse hole through the side thereof with the transverse hole intersecting the axial hole and being of larger diameter than the axial hole; a swab connected to a stiff, bendable stem with the stem being dimensioned to be insertable into the axial hole and to extend into it far enough to reach the transverse hole; and means extendable into the transverse hole to lock the swab against movement in a direction parallel to the long axis of the handle.

3,896,553
DENTAL INSTRUMENT AND CLAMP
Jacob Fagelman, 1022 E. 23rd St., Brooklyn, N.Y. 11210
Filed Oct. 3, 1973, Ser. No. 395,212
Int. Cl.[2] A61C *5/12*
U.S. Cl. 32—63 **5 Claims**



1. A dental instrument for carrying and applying a filling material to a cervical cavity of a tooth comprising, in combination, a flexible sheet of non-corrosive metal of arcuate shape in transverse section with an upper concave surface and having a single forward end portion both longitudinally and circumferentially resilient, said flexible sheet being of stainless steel and of a thickness of about 0.002 inch, means for folding said forward end portion of said flexible sheet into a predetermined arcuate form and a rear body portion of said flexible sheet into a coiled form, said forward end portion having a single rounded tip with an arcuate sloping side and an upper concave surface contoured to conform to the surface of a tooth, said folding means being a bushing through which said flexible sheet is inserted and formed thereby into a rounded cervical form at its tip portion and said coiled body portion thereof within said bushing, means for securing said flexible sheet within said bushing, said securing means being a mandrel disposed within said coiled body portion of said flexible sheet for pressing said body portion against an inner wall of said bushing, said forward end portion being adapted to carry and apply said filling material to said tooth cavity and held compressed against said filled tooth a predetermined time interval, and clamping means for holding said flexible sheet against said filled tooth, whereby said filling material upon setting is conformed to the tooth surface by said forward end portion.

3,896,554
HOLDER FOR RULES AND SIMILAR MEASURING INSTRUMENTS
Edwin M. Pacion, 2518 N. 22nd Ave., Phoenix, Ariz. 85009
Filed June 3, 1974, Ser. No. 475,776
Int. Cl.[2] G01B *3/04;* **B43L** *7/00*
U.S. Cl. 33—107 **6 Claims**



1. A holder for detachably securing a longitudinally elongate generally flat measuring rule having opposite sides, at least one of said sides carrying indicia along a longitudinal edge, said holder comprising:
a. a generally elongate body member having a pair of legs laterally projecting from said body defining an acute angle therebetween, at least one of said legs defining a substantially flat mounting surface extending substantially the length of said body, and said surface having a lateral width substantially corresponding to the width of the rule to be secured;
b. a flange projecting from said body and partially overlying said mounting surface and defining a rule receiving slot therewith, said slot being of a lateral depth to expose a major portion of the indicia carrying side of the rule when said rule is inserted in the slot; and
c. spring retaining means adapted to engage said body and the exposed indicia carrying sides of the rule to exert a retaining force thereagainst whereby rule can be inserted in said slot and in contact with said retaining means and supported on said mounting surface against undesired flexure.

3,896,555
BUTTON SHANK DEPTH GUIDE
Barbara M. Lutz, 3615 Fleetwood Dr., San Bruno, Calif. 94066
Filed July 31, 1974, Ser. No. 493,448
Int. Cl.[2] G01B *3/30*
U.S. Cl. 33—168 R **3 Claims**

1. A button shank dept guide for guiding sewing of a button to cloth, said guide comprising an elongated tapered strip having two substantially planar opposite surfaces separated by a first thickness at one end of said strip and a second and greater thickness at the other end of said strip such that the

distance between said opposite surfaces continuously increases from said first thickness to said second thickness, said strip having an elongate edge between said opposing surfaces, said edge being interrupted by a plurality of spaced apart notches extending between said opposite surfaces and through

said strip, said depth guide adapted to be placed on said cloth with a selected notch positioned between said cloth and said button such that the shank of said button is in said notch, wherein the position of said button with respect to said cloth is determined by the thickness of said selected notch.

3,896,556

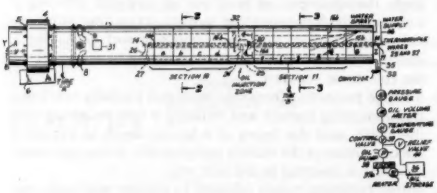
COOLING AND DE-DUSTING OF HOT PARTICULATE MATERIAL PARTICULARLY CALCINED PETROLEUM COKE

Franklin H. Welter, Port Arthur, Tex., assignor to Great Lakes Carbon Corporation, New York, N.Y.

Filed June 28, 1973, Ser. No. 374,788

Int. Cl. F26b *7/00*

U.S. Cl. 34—9 **63 Claims**



1. A method of cooling a hot particulate material which comprises the following steps:

a. Introducing the particulate material into an initial zone of a slightly inclined continuously rotating, cylindrical rotary cooler which is of substantial length and cross-sectional area;

b. Spraying water onto the material is an entry portion of the initial zone of the rotary cooler, thereby substantially cooling said material;

c. Further cooling said moistened particulate material by continuously introducing it into a following portion of the initial cooling zone in said cooler, said following portion of the initial cooling zone being of sufficient length that substantial additional cooling of the material is effected, the temperature of the particulate material in said following portion of the initial zone also being sufficiently high that its moisture content becomes substantially reduced;

d. Further cooling said material and simultaneously also substantially reducing its fines and de-dusting it by passing it through a compartmentalized tumbling zone in said cooler wherein it is intimately coated with a de-dusting agent while it is simultaneously mechanically lifted and rotated, the mechanical lifting and rotation of the material in this tumbling zone being of a nature which provides a substantial amount of free-fall of the particles as they are being coated; and

e. Finally discharging said coated and substantially cooled material from the rotary cooler.

3,896,557

PROCESS FOR DRYING AND STABILIZING COAL

Walter H. Seitzer, West Chester, Pa., and William S. Bradley, Richardson, Tex., assignors to Sun Oil Company (Delaware), Southland Center, Tex.

Filed May 9, 1974, Ser. No. 468,315

Int. Cl. F26b *3/08, 7/00*

U.S. Cl. 34—10 **5 Claims**

1. A process for drying lignitic and subbituminous coal containing from about 25 percent to about 40% by weight water which comprises heating said coal with a fluidizing combustion gas stream containing from about 7 percent to about 9% by volume of oxygen to reduce the moisture content to a level of from about 8 to about 12% whereby said coal is also stabilized against spontaneous combustion.

3,896,558

METHOD OF CONTROLLING DRYING OF TIMBER IN A CLOSED ROOM

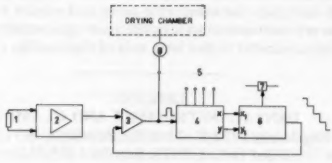
Anders Lovgren, Skelleftea, Sweden, assignor to Alfred Lovgren Byggnads AB, Skelleftea, Sweden

Filed Nov. 5, 1973, Ser. No. 413,131

Claims priority, application Sweden, Nov. 8, 1972, 14458/72

Int. Cl. F26b *7/00*

U.S. Cl. 34—13.8 **6 Claims**



1. A method of controlling the drying of timber which comprises

a. placing the timber in a closed drying chamber, sensing the humidity in the closed chamber and emitting an electronic signal in proportion to the thus sensed humidity,

b. feeding the signal generated in step (a) to a comparator means having an upper and lower hysterisis level at its input and comparing the signal generated in step (a), which represents the actual humidity in the drying chamber, with an upwardly and downwardly adjustable nominal value for humidity which must not be greater than the value for the highest allowable humidity in the drying chamber,

c. initiating ventilation of the drying chamber when the actual value of the humidity exceeds the nominal value valid at the moment in question plus the difference between said nominal value and the upper hysterisis level of said comparator means,

d. discontinuing ventilation of the drying chamber when the actual humidity value in the drying chamber falls below the nominal value valid at the moment in question minus the difference between said nominal value and the lower hysterisis level of the comparator means,

e. effecting further ventilation of the drying chamber when the actual value of the actual humidity in the drying

chamber exceeds the nominal value at the moment in question plus the difference between said nominal value and the upper hysterisis level of said comparator means, f. repeating steps (d) and (e) any desired number of times,

g. measuring the time elapsed between each cessation of ventilation and each subsequent initiation of ventilation, h. changing the aforesaid nominal value when the time measured in step (g) falls outside a certain time interval.

3,896,559

MACHINE FOR DRYING BY CONTACT VENEERS OBTAINED BY PEELING OR SLICING WOOD

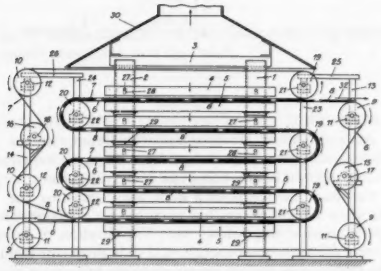
Jean-Marie Michel Martin, 23, rue de Turin, 75008 Paris, France

Filed Mar. 26, 1974, Ser. No. 455,001

Claims priority, application France, Mar. 28, 1973, 73.11060; Feb. 28, 1974, 74.06808

Int. Cl. F26b *9/00*

U.S. Cl. 34—162 **6 Claims**



1. A machine for drying by contact veneers obtained from peeled or sliced wood, comprising in combination a frame, a plurality of pairs of heating plates supported on the frame, the plates of each said pair being vertically superposed and said pairs being disposed one above the other, the upper heating plate of each pair being vertically movable on and relative to the frame toward and away from the lower heating plate of each pair, a plurality of endless flexible conveyor belts, means positioning a pair of runs of two said belts between each said pair of heating plates to move between said plates veneers disposed between said runs when said upper plates are raised and to retain said veneers motionless between said plates when said upper plates are lowered into contact with the upper of said runs, and a hood above said heating plates for removing steam emitted by said veneers.

3,896,560

TWO-STAGE FLUIDIZED BED REACTOR WITH NOZZLE TUYERES

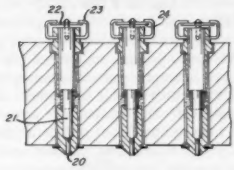
William A. Knepper, Franklin Twp., Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed June 18, 1973, Ser. No. 371,107

Int. Cl. F26b *17/10*

U.S. Cl. 34—57 R **4 Claims**

1. A tuyere for use in conveying hot reducing gas through the floor of a fluidized bed reaction chamber comprising a generally tubular member defining a lower restricted vertical orifice, a connecting segment having an internal diameter at least 2 times the orifice diameter and at least 20 times as long as the orifice diameter, a terminal opening having a cross sectional area at least the area of the connecting segment, and a horizontal cap perpendicular to said terminal opening which, together with the terminus of said connecting segment, defines a cylindrical orifice having a cylindrical area no less than that of said terminal opening, said cap protruding around said terminal opening and beyond to at least a point on the angle of repose of the material to be treated, taken from the terminal opening, whereby gas entering said lower restricted



vertical orifice at a velocity of from 400 to 500 feet per second is reduced in velocity to from 50 to 100 feet per second and exits transversely through said cylindrical orifice.

3,896,561

VESSEL FOR AN AIRMIXER OR THE LIKE

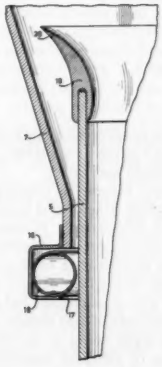
Robert Jacques Roest, Aerdenhout, and Pieter van Ruitenburg, Uithoorn, both of Netherlands, assignors to Air Process AG, Altdorf, Switzerland

Filed Apr. 30, 1974, Ser. No. 465,628

Claims priority, application Netherlands, May 4, 1973, 7306293

Int. Cl.² F26B *17/00;* **F27B** *15/00*

U.S. Cl. 34—57 A **2 Claims**



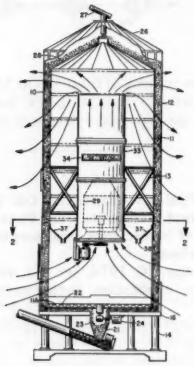
1. A vessel for a device for treating a substance which is fluidized by means of a gas blown from below into the vessel, such as air; the vessel comprising a porous member disposed over the bottom, such as a perforated plate; a space in the vessel between said bottom and said porous member serving to supply the gas to be blown into the vessel; a circumferential wall situated above said porous member and consisting of two parts, the cross-section of the lower part being inferior to that of the upper part, means for moving up and down said lower part; a portion of the latter continuously overlapping the lower end of said upper part; and a holder for accommodating an expansible member, such as an inflatable tire, arranged at said lower end of the upper part, so that said expansible member consitutes in an expanded condition a gas-tight closure between portions of at least one of the two wall parts; as well as a flexible flap arranged on the upper edge of said lower wall part above said porous member, said flap consisting of an elastic material, whereas a lip-shaped end portion of said flap, turned away from said upper edge, is outwardly directed.

3,896,562

GRAIN CONDITIONING APPARATUS

Walter H. Zimmerman, Litchfield, Ill., assignor to Zimmerman Equipment Co. Inc., Litchfield, Ill.

Filed Feb. 16, 1972, Ser. No. 226,797
Int. Cl. F26b *17/12*
U.S. Cl. 34—174 6 Claims



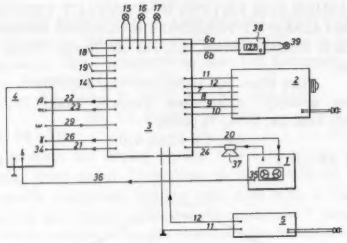
1. Grain drying and conditioning apparatus comprising:
a. a pair of spaced air pervious walls for confining a column of grain to be heated and dried,
b. blower and heater means for causing heated air to be forced through a first zone of said column of grain in one direction to heat and extract moisture therefrom and simultaneously causing air for cooling said grain to be forced through a second zone of said grain column in a direction opposite to the flow of said heated air,
c. means providing a by-pass passage between the discharge side and the intake side of said blower and heater means,
d. said pervious walls being in the form of concentric circular cylinders of different diameters and spaced to confine a hollow column of grain,
e. said blower and heater means being in the form of an assembly including a duct having an impervious wall and being mounted within said inner pervious wall for heating and impelling air from said first zone to said second zone,
f. baffle means between the duct of said blower and heater assembly and said inner pervious wall having a by-pass passage to permit particulate matter discharged from the exhaust side of said blower to pass directly into the inlet side of said duct while permitting restricted air flow therethrough,
g. said baffle means being in the form of a pair of conical sections in anti-nested relation with the outer edge of one of said sections being in engagement with said duct of said blower and heater assembly and the other of said sections having its outer edge in engagement with the inside of said inner pervious wall, the apices of said sections being adjacent each other but spaced to provide an annular by-pass passage for particulate matter and combustible debris between the exhaust side and the intake side of said blower and burner assembly.

3,896,563

AUDIO-VISUAL TEACHING MACHINE

Niels Jensen, Lille Vaerlosevej 49, 3500 Vaerlose, Denmark

Filed Nov. 27, 1973, Ser. No. 419,301
Claims priority, application Denmark, Nov. 29, 1972, 2703/72
Int. Cl.[2] G09B *7/02*
U.S. Cl. 35—9 A 6 Claims



1. An audio-visual teaching apparatus comprising a slide projector and a play-back device for a magnetic tape having recorded thereon instructions, questions, and silent periods, said play-back device having means for arresting the tape travel when a silent period has persisted for a predetermined duration considerably longer than the duration of intervals occurring during normal speech, said slide projector including a slide shifting mechanism for successively bringing a number of slides into a viewing position in said projector, each slide having a frame provided with code means to represent which of two possible answers to a given question, recorded on said magnetic tape, is correct, and the apparatus further comprising a sensing means to cooperate with the code means and determine which of the two possible answers to said question is correct, a response means to be actuated by a student to provide his answer to the question, and a control means operative only when the tape is stationary to compare the answer provided by the student with the correct answer as determined by the sensing means, provide an indication of whether or not the answer provided by the student is the same as the correct answer as determined by the sensing means, and start the tape travel one more.

3,896,564

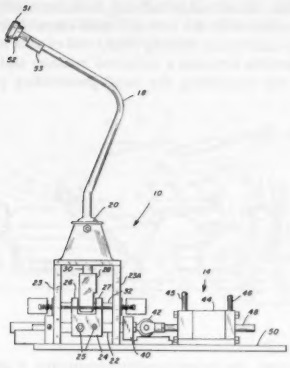
TRUCK DRIVER TRAINING APPARATUS

James W. Dewey, Broken Arrow, and Alvin C. Eaton, Tulsa, both of Okla., assignors to Atkins & Merrill, Incorporated, Tulsa, Okla.

Filed Dec. 3, 1973, Ser. No. 421,434
Int. Cl. G09b *9/04*
U.S. Cl. 35—11 13 Claims

1. In a training apparatus for use in training operators of vehicles having manual transmissions, the improved simulator of a gear shift mechanism comprising;
a. a frame;
b. a first shaft adapted to rotate and to slide in two axially aligned bearings in said frame;
c. a second shaft clamped to and parallel to said first shaft;
d. at least one plate attached to said frame with at least two openings, into which said second shaft can be sequentially inserted by rotating and axially traversing said first shaft;
e. force indicating means indicative of the axial force acting on said first shaft;

f. actuator means acting coaxially on said force indicator and said first shaft; and



g. servo means responsive to said force indicating means for axially traversing said first shaft.

3,896,565

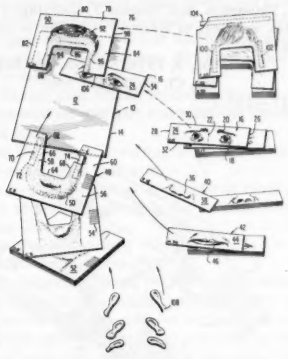
FACIAL IDENTIFICATION SYSTEM WITH RELEASABLY ENGAGED COMPONENTS

William T. Quinn, III, 681 Park Ave., Freehold, N.J. 07728

Filed Dec. 11, 1973, Ser. No. 423,697

Int. Cl. G09b *1/08*

U.S. Cl. 35—28 **1 Claim**



1. In an apparatus for the assembly of correlated front and side facial representations based upon recall, in either order, the apparatus being of the type wherein plural components are arranged in an order to permit selection of recalled characteristics and interchange of components, the improvement comprising: respective backing plates for frontal and side facial components, each plate being of a dimension sufficient to accommodate an assembled facial representation on one surface thereof; each plate being formed of magnetic material; a series of non-magnetic facial component bearing strips, including a plurality of eye strips, a plurality of nose strips and a plurality of mouth strips, selected combinations of said strips being alignable on the surface of each backing plate to form a mid-face representaion; a series of lower face bearing components selectively engageable on the frontal facial backing plate, said lower face bearing components having a main section bearing the jowl portion of the face and having side portions bearing facial side representations; said lower face bearing components having magnetic strips on the side facing the plate supporting the same, on those portions overlying said non-magnetic facial component bearing strips, and being adhered magnetically to the plate in partial overlapping relation to the facial component bearing strips; a series of upper face bearing components selectively engageable on said frontal facial plate, the upper face bearing components having an upper portion bearing a forehead and hair or scalp representation, and having depending side portions extendable over said side portions of the lower face bearing component; the upper face bearing components having magnetic strips on the side facing said plate, along said side portions, with the side portions being adhered magnetically to the plate in partially overlapping relation to the facial component bearing strips and the lower face bearing component side portions; and a series of ear representation members, said ear representation members being magnets and being adhered magnetically in selective position on the depending side portions of the upper face bearing component; whereby, said magnetic strips bearing said non-magnetic facial component bearing strips maintain said strips in proper alignment and in position on said underlying plate, and said ear representation members being held magnetically in position on said depending side portions of the upper face bearing components by magnetic attraction extending therethrough between said magnet ear representation members and said underlying magnetic plate, said side facial plate being likewise formed of magnetic material, and said apparatus further including a series of substantially L-shaped head and neck bearing forms, the head representation being located substantially on a first portion of the form and the neck on a second, perpendicular portion thereof; the forms being magnetic and being magnetically adhered to the side facial plate selectively, a series of eye representation bearing strips for said side facial backing plate, each having an upper side edge adapted for abutment against the first portion of the form, a slant forward edge, and a lower edge; a series of mid-face and nose bearing forms for said side facial plate, each having a first upper edge abutted against the lower edge of the eye representation strip, a slant mid-edge abutted against the slant forward edge of the eye representation strip, and a lower edge; a series of mouth representation bearing strips for said side facial plate with the upper edges of said mouth representation bearing strips engageable with the lower edges of the mid-face and nose forms, and a lower edge; and a series of lower jowl and neck bearing blocks for said side facial plate, said blocks each having an upper edge adapted for abutment against a lower edge of the mouth representation bearing strips; at least the lower jaw and neck bearing blocks being magnetically adhered to the side facial plate; and a series of ear members selectively magnetically adhered to the plate in a selected position relative to the representation and wherein corresponding frontal and side; chin, lip, eye, ear, mouth and upper and lower face bearing components, respectively, having correlated indicia thereon to permit the instantaneous composition of a side facial representation after completion of a frontal facial representation and vice versa.

3,896,566

SUBMARINE DIGGING WHEEL WHICH DISCHARGES MATERIAL IN AN AIR CHAMBER

Cornelis Van der Gaag, Delft, Netherlands, assignor to N.V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands

Filed Feb. 21, 1974, Ser. No. 444,387

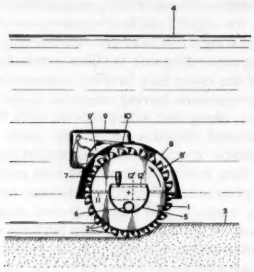
Claims priority, application Netherlands, Feb. 21, 1973, 7302421

Int. Cl. E02f *3/92*

U.S. Cl. 37—56 **3 Claims**

1. A submarine dredge comprising a bucket wheel rotatable about a horizontal axis, a hood surmounting the bucket wheel, means to inject compressed air beneath the hood to drive the water level beneath the hood below the top of the bucket wheel so that the buckets discharge submarine soil into open

air beneath the hood, a hopper within the wheel to catch submarine soil that falls from the buckets through the air into



the hopper, and a suction pipe to withdraw submarine soil and water from the hopper.

3,896,567

DREDGING BUCKET HAVING A REINFORCED EDGE

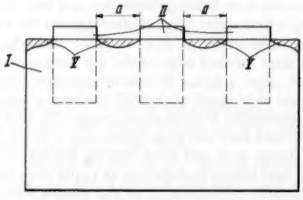
Bernd Kos Leoben, and Alois Kubasa, Mitterdorf, both of Austria, assignors to Gebr. Boehler & Co. AG, Vienna, Austria

Filed Nov. 8, 1973, Ser. No. 414,092

Claims priority, application Austria, Nov. 24, 1972, 10006/72

Int. Cl. E02f *9/28;* **B23p** *3/00*

U.S. Cl. 37—141 R **2 Claims**



1. As an improved article of manufacture, a reinforced dredging bucket of hard manganese steel, the bucket having an edge formed from a plurality of successively alternating, integrally cast first and second regions, each first region consisting by weight of 0.5 – 2 % carbon, 6 – 30 % manganese, up to 3 % of at least one element selected from the group consisting of silicon, chromium, molybdenum, and vanadium, the remainder being iron and steel impurities, each second region consisting by weight of 1.2 – 4 % carbon, 15 – 30 % chromium, 0.2 to 10 % manganese, 0.1 – 5 % silicon, up to 10 % nickel, up to 10 % of at least one carbide-forming or nitride-forming element selected from the group consisting of tungsten, molybdenum, vanadium, tantalum, niobium, and titanium, the remainder being iron and steel impurities.

3,896,568

SCAPER BLADE HAVING ADJUSTABLE SECTION

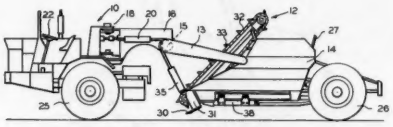
James E. Hancock, Lubbock, Tex., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 8, 1974, Ser. No. 440,885

Int. Cl. E02f *9/28*

U.S. Cl. 37—141 R **4 Claims**

2. In a mobile scraper having a dirt collecting bowl defined by side walls, a floor and end wall, being open at the front, a scraper blade fixed between the side walls at the lower front portion thereof and inclining forwardly to a cutting edge adapted to be lowered to the ground for digging, said scraper blade comprising a blade frame secured between the side walls having a forwardly inclined upper surface, a plurality of blade sections mounted on the upper surface of the blade frame in side-by-side relationship defining a substantially continuous upper surface with the forward ends thereof defining a substantially continuous cutting edge, one of said blade sections being movable between a retracted position and an extended position for increasing the local penetrating power of the



cutting edge, the improvement comprising a shiftable blade platform supporting said movable blade section on the blade frame including, spaced, longitudinally extending runners slidable on the upper surface of the blade frame, transversely extending guide ribs attached to the blade frame and extending laterally between the runners defining parallel guide paths, and an actuator attached to the blade frame operable for extending or retracting said blade section.

3,896,569

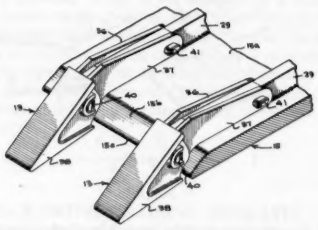
EARTH WORKING IMPLEMENT AND TOOTH ASSEMBLY THEREFOR

George J. Thompson, and Thomas T. Dalrymple, both of Marion, Ohio, assignors to Marion Power Shovel Company, Inc., Marion, Ohio

Filed Apr. 9, 1974, Ser. No. 459,401

Int. Cl. E02f *9/28, 3/40*

U.S. Cl. 37—141 T **39 Claims**

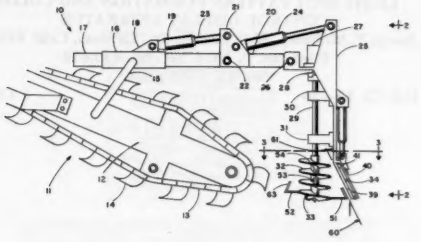


1. An earth working implement comprising a body having a wall provided with a forwardly and transversely disposed lip portion, means for attaching said body to a machine, the lip portion of said bottom wall having a plurality of transversely spaced ribs, each of said ribs having forwardly and rearwardly disposed pin receiving openings, a pair of base plates mounted on the sides of each of said ribs, each of said base plates having pin receiving openings registered with the openings in an adjoining rib, a plurality of tooth points each having a rearwardly opening socket receiving the forward end of a set of rib and adjoining base plates for mounting the tooth point thereon, each of said tooth points having side walls with openings registered with a set of openings in the adjoining set of base plates and rib on which said tooth point is mounted, and pins disposed in said registered openings for securing said base plates on said ribs and said tooth points on adjoining rib and base plate sets.

3,896,570
TRENCHING MACHINE ATTACHMENT FOR WIDENING TRENCH BOTTOM WITH DIRT REMOVING AUGER

Russell L. McMurray, R.R. No. 2, Du Quoin, Ill. 62832

Filed Sept. 28, 1973, Ser. No. 401,634
Int. Cl. E02f *5/06*
U.S. Cl. 37—87 **3 Claims**



1. In an attachment to a trenching machine for widening the bottom of a trench wherein the trenching machine includes a driven endless chain with plates mounted thereon to dig said trench and carry dirt out of said trench, said attachment includes a frame mounted to said machine and having an axle with a plurality of blades mounted thereon, said attachment includes first means on said frame and connected to said blades operable to rotate said blades against said trench and widen the bottom of said trench wherein the improvement comprises:

second means mounted to said frame and positioned adjacent said blades with said blades positioned between said trenching machine and said second means which is operable to engage opposite sides of said trench subsequent to widening and to prevent loose dirt from passing by said second means; and,

an auger having said blades mounted thereon with said auger mounted on said axle and rotatable simultaneously with said blades;

said blades each have a cutting edge positioned a fixed radial distance from said axle;

said radial distance of at least some of said blades is different than said radial distance for at least some of the remaining blades;

at least some of said cutting edges are located at different axial positions along said axle;

said second means includes a pair of walls mounted to said frame and means mounted to said frame and connected to said pair of walls operable to retract and extend said pair of walls against sidewalls of said trench; and,

said pair of walls are positioned at an acute angle with respect to vertical, said cutting edges are each positioned at an acute angle identical to said acute angle of said pair of walls.

3,896,571
MULTI-WHEELED EXCAVATOR AND CONVEYING SYSTEM

Charles R. Satterwhite, 10031 Venitian Way, Dallas, Tex. 75229

Continuation of Ser. No. 238,089, March 27, 1972, abandoned. This application Jan. 21, 1974, Ser. No. 435,296
Int. Cl. E02f *3/18*
U.S. Cl. 37—190 **44 Claims**

1. An excavating and loading system comprising:

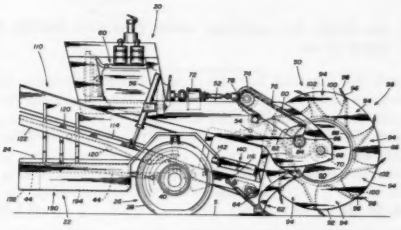
an excavating wheel assembly comprising axle means and at least two rigid excavating wheels rotatably mounted cantilever on and supported on the axle means, said excavating wheel assembly having a width at least equal to the widest portion of the remainder of the system;

each of said excavating wheels including a plurality of digging buckets located immediately adjacent one another to define the entire circumference of the excavating wheel, each bucket having a cutting edge which extends to a stationary wall, and a wall mounted for pivotal movement from a material receiving position to a material dumping position;

supporting and housing means extending between the excavating wheels and connected to the axle means for supporting the excavating wheel assembly;

each of said digging buckets extending continuously between a side wall thereof located immediately adjacent to the supporting means and a side wall thereof defining one end of the excavating wheel assembly;

drive means extending through the supporting and housing means for rotating the excavating wheels so that the digging buckets follow a circular path;



means located within the margins of the excavating wheel assembly and responsive to rotation of the excavating wheels for positively pivoting the movable wall of each digging bucket of the excavating wheels to the material receiving position when the bucket is in the lower and forward portion of the path and for positively pivoting the movable wall to the material dumping position when the bucket is in the upper and rearward portion of the path; a vehicle for supporting and manipulating the excavating wheel supporting means and thereby positioning the excavating wheel assembly in engagement with material to be excavated; and

conveyor means mounted on the vehicle entirely behind the excavating wheel assembly for movement around a course including a relatively low portion positioned to receive material from the digging buckets of the excavating wheels upon the positioning of the movable walls of the buckets in the material dumping position and a relatively high material delivery portion located rearwardly on the vehicle from the low portion.

3,896,572
FLASH/FLOODED BOILER STEAM IRON

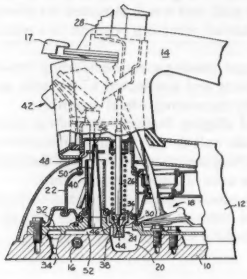
Ronald E. Jeffress, Alta Loma, Calif., assignor to General Electric Company, Bridgeport, Conn.

Continuation-in-part of Ser. No. 358,052, May 7, 1973, abandoned. This application May 20, 1974, Ser. No. 471,697
Int. Cl. D06f *75/06*
U.S. Cl. 38—77.83 **17 Claims**

1. In a steam iron having a water tank and a steam generating soleplate having a boiler therein, the improvement comprising;

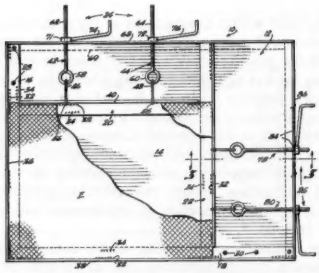
metering means intermediate the water tank and the boiler fixedly sized for selectively preventing flow of water therebetween and for selectively permitting flow of water at a plurality of flow rates, said plurality of flow rates including a first rate selected to maintain the boiler in a flooded condition at least during iron operation at a first range of ironing temperatures and a second rate selected to maintain the boiler in a flash steam condition at least

during iron operation at a second range of operating temperatures and distribution means communicating with



the boiler for supplying steam generated therein to a point of use.

3,896,573
FABRIC STRETCHER DEVICE
Mabel K. Gibby, 4501 Granada Blvd., Coral Gables, Fla. 33146
Filed Sept. 20, 1974, Ser. No. 507,719
Int. Cl.[2] D06C *3/08*
U.S. Cl. 38—102.5 **9 Claims**



1. An adjustable stretcher device for stretching a generally rectangular piece of fabric comprising;

A. a generally rectangular base member providing,

1. a planar top surface;

B. a pair of side rails fixed in an angular relation relative to a first pair of adjoining side edges of said planar top surface and including,

1. at least one row of relatively closely spaced barbs along the lengths of both of said pair to engage through and hold corresponding, adjoining edge portions of the piece of fabric to be stretched;

C. a third rail similar to said pair, to similarly engage and hold a third edge portion of the piece of fabric;

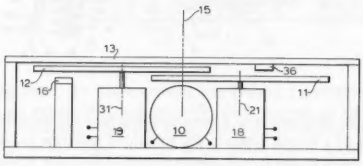
D. a first adjustment and tensioning means connecting between a third edge of said base member and said third rail to adjust said third rail relative to the first of said pair to conform with a first dimension of the fabric piece and to apply tension forces along the length of said first dimension;

E. a fourth rail, similar to said pair and third rail, to similarly engage and hold the fourth edge portion of the piece of fabric;

F. a second adjustment and tensioning means connecting between the fourth edge of said base member and said fourth rail to adjust said fourth rail relative to the second of said pair to conform with a second dimension of the fabric piece and to apply tension forces along the length of said second dimension;

G. adjustable extension means connecting between said first and second adjustment and tensioning means and the respective third and fourth rails.

3,896,574
LIGHT SPOT PATTERN FORMATION AND COLOR CONTROL DISPLAY APPARATUS
Joseph T. McNaney, 8548 Boulder Dr., La Mesa, Calif. 92041
Filed Jan. 3, 1974, Ser. No. 430,478
Int. Cl. G09f *13/36*
U.S. Cl. 40—34 **1 Claim**



1. Light spot pattern formation and color control apparatus comprising:

a. a light source;

b. first, second and third light passage control members;

c. axle means supporting said first and second members, respectively, for rotation thereof one with respect to the other and each with respect to said third member and to said light source, said first and second members being intermediate said third member and said light source;

d. indexing means for indexing said first and second members, respectively, in any one of a plurality of index positions with respect to said third member upon rotation thereof;

e. said first member having a plurality of light attenuating means each controlling the color of light upon passing therethrough from said light source;

f. said second member having a plurality of predetermined positioned window means therethrough each controlling the pattern of light upon passing therethrough from said light source;

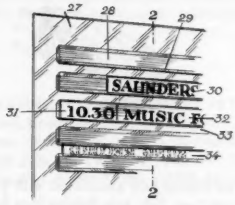
g. said third member presenting a display surface and having window means therethrough to said surface;

h. said indexing means effecting an optical alignment of an individual one of said light attenuating means of said first member, an individual one of said window means of said second member, and said window means of said third member, whereby the different hue and pattern of light spot formations presented at the display surface of said third member is dependent upon the indexing of said first and second members with respect to said third member, the indexing means of said first member including predetermined arrangement of magnetic material means supported thereby and reference magnetic element means fixedly supported in relation thereto for magnetically influencing the stoppage of said first member and thereupon effecting the optical alignment of one of said attenuating means with the window means of said third member, and the indexing means of said second member including predetermined arrangement of magnetic material means supported thereby and reference magnetic element means fixedly supported in relation thereto for magnetically influencing the stoppage of said second member and thereupon effecting the optical alignment of one of said window means thereof with the window means of said third member.

3,896,575
MECHANICAL MEANS TO FACILITATE CHANGEABLE RECORDS

Sebet Silverman, 31 Mohawk Trl., Westfield, N.J. 07090

Continuation of Ser. No. 156,420, June 24, 1971, abandoned.
This application Sept. 10, 1973, Ser. No. 390,046
Int. Cl.[2] G09F 11/30
U.S. Cl. 40—64 R 3 Claims



1. A display device for showing written information in a changeable manner to be viewed for reading or copying, said device comprising:

a. a single plastic transparent flexible sheet having a planar surface lying in a first plane,

b. a plurality of spaced elongated rectangular recesses formed along said sheet and from one side thereof, each extending substantially across the sheet,

c. the plurality of elongated rectangular recesses are formed substantially parallel to each other and have a trapezoidal cross sections with enlarged flat bottom walls and inclined side walls sloping towards one another in a direction away from said bottom wall,

d. said bottom walls of the elongated rectangular recesses normally lie in a second plane,

e. elongated rectangular display strips, each being removably insertable into one of said elongated rectangular recesses, respectively, to matingly cooperate therein so as to lie substantially in flat engagement upon the bottom wall thereof by means of the coaction of the opposed side walls, and

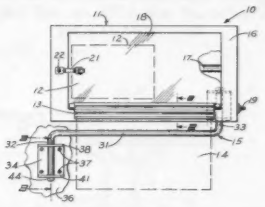
f. each of the display strips is viewable through one of the respective bottom walls in which it is insertable whereby said bottom wall forms a protective transparent layer over any written information contained on the said display strips.

3,896,576
DENTAL X-RAY FILM AND CHART VIEWING APPARATUS

Hugo M. Wolf, 1451 N.E. Glacier Ln., Minneapolis, Minn. 55421 and Leo H. Wolf, 2000 Idaho Ave. So., Minneapolis, Minn. 55426

Filed Aug. 1, 1973, Ser. No. 384,466
Int. Cl.[2] G09F 13/10
U.S. Cl. 40—106.1 11 Claims

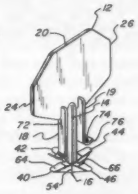
1. An apparatus for displaying information located on transparent media and a sheet member comprising: viewer means providing a light background for viewing information on transparent media, said viewer means having a generally rectangular frame having a lower section, a light transparent sheet member having an outside surface located on a front side of the frame, light source means within the frame providing a light background behind the sheet member, means for holding the transparent media adjacent the outside front surface of the sheet member whereby the information on said media can be visually inspected, holder means attached to the front of the lower portion of the frame for holding a sheet member in substantially co-planar relationship with said transparent media and in position for concurrent visual inspection of the information on the transparent media and sheet member, said holder means comprising a member having a back member extending horizontally along and attached to the lower portion of the viewer means and a front member connected to the back member, said front member inclined downwardly toward the back member, and roller means located between the front member and the back member to hold the sheet member, and support means movably mounting the viewer means on a stationary member, said support means comprising an elongated generally horizontal arm, said arm having a first downwardly directed end at one end thereof and a second upwardly directed end at the other end thereof, first bracket means pivotally mounting said first end on a support for movement about a first generally upright axis, and second bracket means secured to one end of said frame and pivotally accommodating said second upright end of the arm for rotating the viewing means about a second generally upright axis, said second upright axis being generally parallel to said first upright axis.



3,896,577
ONE PIECE ANIMAL IDENTIFICATION TAG

Norman J. Hayes, care of Standing Star Simmental Ranch, North of Cody, Park County, P.O. Box 618, Cody, Wyo. 82414

Filed Apr. 29, 1974, Ser. No. 465,285
Int. Cl.[2] G09F 3/00
U.S. Cl. 40—301 21 Claims



1. A one piece identification tag member of molded resilient plastic material for mounting on the top of the ear of an animal in a vertical attitude comprising:

an upper identification portion adapted to be mounted in a vertical attitude above the ear of an animal,

a shaft portion downwardly depending from said identification portion and adapted to extend through the ear,

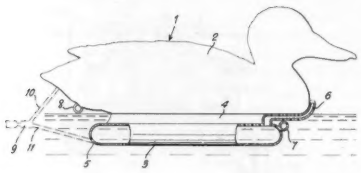
a retaining head portion on the lower end of said shaft portion having first upwardly facing inner ear abutting means for engaging an inner surface of the ear and supporting said head portion thereagainst,

resilient supporting leg means downwardly depending from said identification portion for supporting said identification portion and said shaft portion relative to the ear, and second downwardly facing outer ear abutting surface means on the lower end of said leg means for engaging an outer surface of the ear to hold the tag member in the vertical attitude while permitting temporary resilient deflected displacement of said identification portion relative to said shaft portion.

3,896,578
SELF-BALLASTING DECOY WATERFOWL

Augusto Franceschini, Via Argine Vecchio Volano, Rero(Province of Ferrara), 44030 Italy

Filed Apr. 22, 1974, Ser. No. 462,633
Claims priority, application Italy, May 3, 1973, 12602/73
Int. Cl. A01m *31/06*
U.S. Cl. 43—3 3 Claims

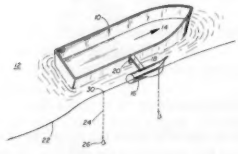


1. A self-ballasting floating decoy waterfowl comprising:
a. a floating body in the form of a closed hollow body representing a waterfowl, having an underside intended to directly rest on the water and a water line located above said underside whenever the decoy is used;
b. a connecting rib depending from the underside longitudinally along said floating body; and
c. a ballast tank attached to said connecting rib and spaced at some distance from the underside of said floating body below the water line thereof, said tank being in the form of a longitudinally elongated hollow tubular body closed at each end and being provided in correspondence to the bottom of said tank at one of said ends with an opening for the passage of the water, and, in correspondence to the top at the opposite end with an upwardly directed air duct, terminating with its free end above the water line of the floating body for the escape of air from said tank.

3,896,579
TROTLINE LIFTER

James K. Benne, 1625 E. 54th Pl., Tulsa, Okla. 74105

Filed Dec. 9, 1974, Ser. No. 530,759
Int. Cl.[2] A01K *79/00*
U.S. Cl. 43—27.4 4 Claims



1. In combination with a trotline of the type having a main line which is normally submerged beneath the surface of a body of water, and which is normally fixedly located at its ends, and having a plurality of spaced leaders attached to said main line, said leaders having hooks attached to the free ends thereof; a trotline lifting device wherein the improvement comprises an elongated guide member having a front end and a rear end, an outwardly flared lip spiraling upwardly and rearwardly from said front end to said rear end, means for attaching said guide member to the side of a fishing vessel, said guide member engaging said main line of said trotline therein and said lip engaging said leaders of said trotline thereon, thereby lifting said leaders so that said leaders may be inspected and serviced, said leaders progressing along said lip as said fishing vessel advances along said main line and said leaders disengaging from said guide member as said leaders pass beyond the rear end thereof.

3,896,580
ARTIFICIAL FISHING LURE

William O. Williams, Jr., 1309 Lynhurst Dr., Gastonia, N.C. 28052

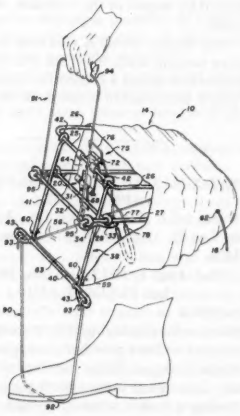
Filed Feb. 13, 1974, Ser. No. 442,128
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.31 10 Claims

1. An artificial fishing lure associated with hook means for attracting and catching fish, said fishing lure including a pair of extending side pieces, each said side piece being of identical shape and simulating in appearance the side of a fish, said side pieces being arranged in superimposed relation to one another with one extending end of each side piece being joined together by a first connecting means and the other extending end of each side piece being joined together by a second connecting means, said first and second connecting means constituting the sole connection between said side pieces and being arranged to provide a loose connection at said ends of said side pieces that maintain said side pieces in generally parallel relation while permitting limited relative shifting thereof.

3,896,581
ANIMAL TRAP

William Gabry, Box 10, Vavenby, British Columbia, Canada

Filed Sept. 26, 1973, Ser. No. 400,822
Int. Cl. A01m *23/24*
U.S. Cl. 43—81 3 Claims



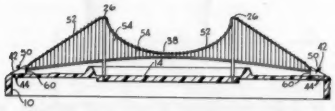
1. A trap comprising a wire frame having side portions and a bottom portion, said side portions each having front and rear corner bars interconnected by a front bar, a striker jaw interconnecting the front corner bars, said bottom portion having side bars secured at ends thereof to the front bar and connected at opposite ends thereof by a fixed jaw, said striker jaw including upper and lower bars spaced one on either side of the fixed jaw, said front and rear corner bars being connected by loops biasing the striker jaw towards the fixed jaw, stop

means on the fixed jaw engageable by a frame part when the trap is sprung, said bottom portion and front bar defining an entrance opening for the head of an animal, a hood covering substantially all of the frame except the entrance opening, a trigger assembly mounted on the front bar to support the striker jaw in a set position across the entrance opening from the fixed jaw, said trigger assembly including a base plate, a sear pivotally mounted on the base plate and having a seat adapted to receive a part of the striker bar when the trap is set, and a bait supporting trigger pivotally mounted on the base plate above the entrance opening to releasably engage the sear.

3,896,582
BRIDGE CONSTRUCTION SET

Richard J. Cohen, Brooklyn, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed July 18, 1974, Ser. No. 489,808
Int. Cl.[2] A63H *33/06;* **G09B** *19/00*
U.S. Cl. 46—17 **4 Claims**

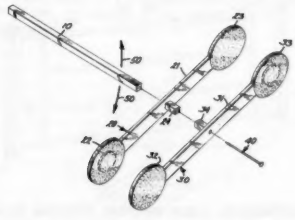


1. A kit for constructing toy bridges, comprising a base member having spaced openings therein; at least one roadway element for spanning said base; abutment means adapted for juxtaposition with each end of said base; a plurality of vertical towers fitting in said openings in said base member and intermediate said abutments; a plurality of shaped bridge cables adapted to be stretched between said abutments and to be supported by said towers; and a plurality of vertical wires depending from said cables for holding said roadway in spaced relation with respect to said base member, said kit making possible the erection of models of various bridges when the number, appearance and size of the aforesaid components are changed.

3,896,583
TOY

Walter F. H. Boettcher, Box 8, Cyrus, Minn. 56323

Filed June 11, 1974, Ser. No. 478,235
Int. Cl.[2] A63H *1/32;* **A63J** *5/00*
U.S. Cl. 46—47 **5 Claims**

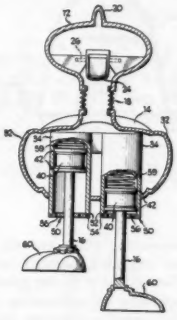


1. A toy comprising, in combination:
a handle having a longitudinal axis;
a pivot extending along said axis from one end of said handle;
first and second rotatable members each containing a central portion and at least one visually distinguishable peripheral portion, at least one of said central portions being transparent;
and bearing means mounting said members in axially spaced relationship for rotation about said pivot, the center of gravity of each member being displaced from the center of rotation thereof.

3,896,584
FIGURE TOY WITH VARIABLE SOUNDING MEANS

Rouben T. Terzian, and Marvin I. Glass, both of Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 14, 1973, Ser. No. 415,673
Int. Cl.[2] A63H *5/00*
U.S. Cl. 46—118 **2 Claims**



1. A sound emitting figure toy, comprising: a torso portion mounted on a plurality of elongated ground supportable legs independently movable in an axial direction relative to the torso portion, each leg including a piston slidably enclosed within an elongated closed cylinder in the torso which defines a sound chamber within the torso and with the legs acting as piston rods extending outwardly of the cylinder for engagement with a supporting surface, at least one vibratory reed mounted on each of the pistons and vibrated by the passage of air across the reed as the piston moves back and forth in the cylinder, and a spring within the closed end of the cylinder and bearing against the piston to urge the piston outwardly relative to the cylinder and thus said legs outwardly relative to said torso portion, whereby the sound emitted is varied as the length of the sound chamber within the cylinder varies and the vibration of the reed is varied depending on the speed at which a user biases either of the legs and pistons into their respective cylinders to cause the air to pass the reed, the legs along with their respective pistons being independent and being positioned to be simultaneously operable by a user biasing said legs against a supporting surface to force said pistons into their respective cylinders whereafter the springs return the respective legs and pistons outwardly relative to the respective cylinder.

3,896,585
FURNACE OR THERMAL BLACK IN DEGRADABLE AGRICULTURAL MULCH

Richard Miller, Belle Mead, and Murray H. Reich, Princeton, both of N.J., assignors to Princeton Chemical Research, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 284,327, Aug. 28, 1972, abandoned. This application Feb. 14, 1974, Ser. No. 442,718
Int. Cl. A01g *7/00*
U.S. Cl. 47—9 **6 Claims**

1. In a degradable agricultural mulch comprising a degradable film of polybutene-1 or polypropylene which is at least about 40% isotactic, which film is about 0.4 to 20 mils thick and has a TALU rating of less than about 75,000 TALU, the improvement which comprises incorporating therein about 0.005 to 2% by weight of a stabilizer and about 0.05 to 5% by

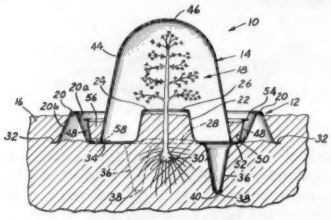
weight of furnace or thermal black having a particle size of about 200 to 800 A.

3,896,586

SYSTEM FOR PROMOTING PLANT GROWTH

Edward Neal Caldwell, Rte. 17, Coward Mill Rd., Knoxville, Tenn. 37921

Filed July 30, 1973, Ser. No. 383,965
Int. Cl. A01g *13/04*
U.S. Cl. 47—28 **1 Claim**



1. A system for promoting plant growth, comprising, in combination, a ground engaging member adapted to be secured in a generally fixed position on the ground, said ground engaging member including an upstanding peripheral wall portion and a generally central upstanding wall portion defining with said peripheral wall portion a continuous trough therebetween, said central portion having an opening therein to allow the protrusion therethrough of a plant rooted into the ground in underlying relation to said opening, said trough having at least one depending root feeder element integrally formed therewith adapted to be inserted into the ground so that the lower end thereof is disposed below the level of said trough, said feeder element being hollow and of generally conical geometry with its apex directed downwardly and having an open upper end communicating with said trough and into which plant nutrient may be introduced and through which water in said trough flows to enhance root growth at a level lower than the level of said trough, and a cover member including a raised central portion and a lower peripheral trough defining portion, said trough defining portion of said cover member including a generally transversely disposed channel in the lower surface thereof to provide communication between inner and outer portions of said trough in said ground engaging member when said member is mounted thereon, and being adapted to be received downwardly into said trough in said ground engaging member for cooperation therewith and being adapted to receive a weight substance therein to maintain said cover member mounted on said ground engaging member against the force of winds or the like which would tend to separate said cover from said ground engaging member, whereby said cover member shields said opening in said generally central portion thereof to protect a plant protruding through said opening.

3,896,587

NURSERY POT HAVING IMPROVED DRAINAGE

Charles J. Insalaco, Pigeon Swamp Rd., South Windham, Conn. 06266

Filed June 25, 1973, Ser. No. 373,451
Int. Cl. A01g *9/02*
U.S. Cl. 47—34 **8 Claims**

1. An open topped plastic nursery pot of circular cross section having a substantially vertical sidewall which is tapered slightly from the top thereof so that the top of said pot is of slightly larger horizontal cross section than is the lower portion thereof in order to permit convenient stacking of a plurality of said pots,

a bottom portion of reduced diameter from the remainder of said pot, said bottom portion having a horizontally extending base member and a wall member joining said base member to the lowermost extension of said sidewall, said wall member being shaped so as to be concave with respect to the centerline of the pot adjacent said base member and convex with respect to the centerline of the pot adjacent said sidewall,

a plurality of drainage holes circumferentially spaced about the bottom portion of said pot coextensive with the concave portion of said wall member, said drainage holes extending partially into said wall member above the concave portion thereof and partially into said base member, each of said drainage holes being substantially quadrilateral in shape, the shape of said wall member, and said drainage holes, rendering said bottom portion more readily flexible than the remainder of said pot,

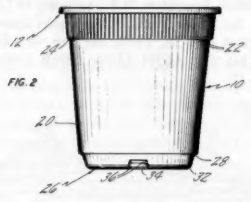


FIG. 2

the center portion of said base member being slightly elevated and extending a short distance into the inside of said pot with respect to the radially outer portion of said base member to form a circular dome which is joined to the radially outer portion of said base member by an outwardly sloping circumferential wall,

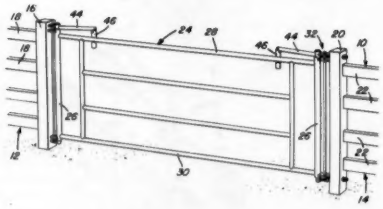
the junction between the lowermost extension of said sidewall and the convex portion of said wall member forming a circumferential fillet which overhangs said drainage holes and shields said drainage holes from direct sunlight during the time of the day when the sun is near its zenith.

3,896,588

COMBINED GATE HINGE AND LATCH

Richard L. Doffin, P.O. Box 23, Hoskins, Nebr. 68740; Kyle I. Delp, Rt. 1, and Vernon L. Delp, 605 E. Park Ave., both of Norfolk, Nebr. 68701

Filed Jan. 30, 1974, Ser. No. 438,014
Int. Cl.[2] E05c *19/14*
U.S. Cl. 49—394 **10 Claims**



1. In combination, a gate member including an upstanding tubular member at one end, a first pair of fixed generally parallel and outwardly projecting arms carried by opposite end portions of said end member and having first vertically aligned, horizontally outwardly opening and upstanding notches formed therein, an elongated upstanding latch member projecting through and journaled in said end member, the end portions of said latch member projecting beyond the upper and lower ends of said end member including a second pair of outwardly projecting arms provided with second verti-

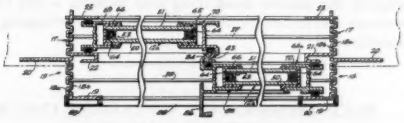
cally aligned, horizontally outwardly opening and upstanding notches formed therein, said second arms being oscillatable with said latch member into and out of positions with the inner ends of said first and second notches in registry with each other and said first and second notches opening in different directions, whereby the registered inner ends of said first and second notches define an upstanding passage through which an upstanding pin may be received and the notched first arms may be horizontally displaced away from said pin in the direction opposite to which the notches in said first arms open after the second notched arms having been swung away from said pin in order to completely disengage said gate member from said pin.

3,896,589

THERMALLY IMPROVED WINDOW FRAME AND SASH

Henry W. Mitchell, Miami, Fla., assignor to Crossley Window Co., Inc., Miami, Fla.

Filed Nov. 30, 1973, Ser. No. 420,606
Int. Cl. E05d *13/02*
U.S. Cl. 49—425 **11 Claims**



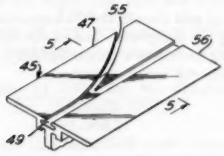
1. A thermally-improved window or door comprising, in combination, a frame, a window sash supported in said frame, said frame being of extruded metal and comprising an upper header member, a relatively spaced, parallel lower sill member, and a pair of spaced parallel stile members interjoining the ends of said header and said sill members, said header, sill and stile members each being of uniform cross-sectional shape along their lengths, the cross-sectional shapes of each of said header, sill and stile members being of such sinuous configuration as to define a plurality of projections projecting outwardly to each side, alternately, in accordion-like fashion, whereby the path of conductive heat flowing through the metal of said frame between the inside and outside thereof will be substantially different from the absolute distance between the inside and the outside of said window frame.

3,896,590

DOOR SAFETY EDGE CONSTRUCTION

Norman K. Miller, Concordville, Pa., assignor to Miller Brothers, Concordville, Pa.

Filed Aug. 9, 1974, Ser. No. 496,113
Int. Cl.² E06B *7/16;* **H01H** *3/16*
U.S. Cl. 49—488 **6 Claims**



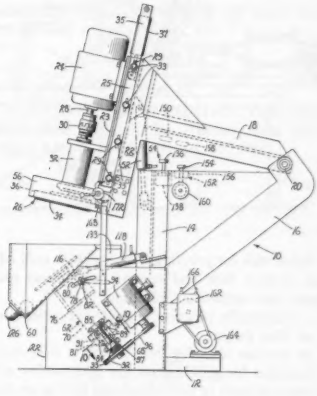
1. A door safety edge comprising a door edge plate for longitudinal extension along a door edge and having an outer surface facing away from the door, said door edge plate having its outer surface generally flat, there being at least one longitudinally extending groove in said outer edge plate surface, said groove having opposite internal undercuts, a resiliently compressible pressure sensitive inner body extending longitudinally along said edge plate adjacent to said groove, a casing of flexible sheet material covering said inner body, an attachment member of relatively stiff flexible material secured to said body adjacent to the door, and at least one relatively stiff rib on said attachment member and located in said groove, said rib including lateral extensions engaged in said undercuts for retention against separation from said plate, said attachment member being generally flat and secured in facing relation with said inner body interposed between the latter and said edge plate, said outer edge plate surface having an access passageway communicating with said groove adjacent to and spaced inwardly from one groove end for passing said rib into said groove.

3,896,591

MACHINE FOR SHARPENING DISC BLADES

Lloyd J. Ruble, 225 S. California, Tulare, Calif. 93274

Filed Dec. 27, 1971, Ser. No. 212,482
Int. Cl. B24b *3/60*
U.S. Cl. 51—126 **20 Claims**



1. A machine for sharpening disc blades comprising:
a frame;
grinder means operatively associated with said frame;
said grinder means having a grinding surface disposable in a generally horizontal grinding plane and rotatable about an axis, said grinder surface having a configuration sufficient to grind the edges of a disc blade;
mandril means operatively associated with said frame and said grinder means, said mandril means includes a mandril housing with a mandril rotatable therein about an axis, said mandril having a proximal end disposed adjacent said frame and a distal end disposed adjacent said grinding plane, and disc blade mounting means on the distal end of said mandril disposed to releasably mount a disc blade for engagement by said grinder means;
grinder mounting means mounting said grinder means in said frame for linear movement in alignment with said grinding surface axis and for pivotal movement to swing said grinder means between a work position with said grinding surface in said grinding plane and a rest position with said grinding surface remote from said grinding plane; and
mandril mounting means mounting said mandril means in said frame with the axis of said mandril means disposed to form an acute angle with said grinding plane, said mandril mounting means having arc adjustment means operable to pivot said mandril means about a pivot point disposed along the axis thereof to vary said acute angle between said grinding plane and said mandril axis, and

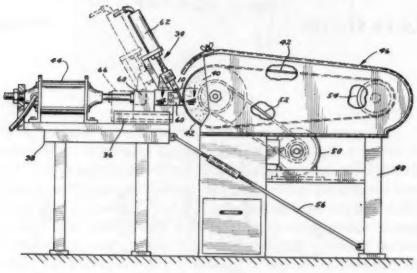
axial adjustment means operable to vary the position of said pivot point along said mandril axis, said mandril mount-means including a pivotal mounting mounted on said mandril housing adjacent the proximal end of said mandril and supported in said frame, said pivotal mounting being movable axially with respect to said mandril housing in alignment with said mandril axis and being movable with respect to said frame to vary the distance between said point of support in said frame and said grinding plane.

3,896,592

APPARATUS FOR SHARPENING BLADES

Donald E. Wintz, St. Paul, Minn., assignor to Aladdin Manufacturing Company, Minneapolis, Minn.

Filed May 6, 1974, Ser. No. 467,009
Int. Cl.[2] B24B *21/12, 3/40*
U.S. Cl. 51—135 R **2 Claims**



1. Apparatus for grinding a first section only of a work piece having at least first and second contiguous and continuous sections, said apparatus including:

a. a rotationally powered cylindrical contact wheel;

b. an idler pulley;

c. an endless abrasive belt having a first strip operatively mounted for grinding on the idler pulley and on a cylindrical portion of said wheel and having an integral second strip extending beyond an edge of the contact wheel;

d. said cylindrical portion of said contact wheel providing a continuous cylindrical support to the first strip of said endless abrasive belt, said first strip thereby being adapted to grind a straight surface of a first section of a work piece; and

e. means to hold said first section of said work piece against said abrasive belt to force said cylindrical support surface of said wheel against said first strip of said belt;

f. said second strip of said belt, when said first section of said work piece is so held, maintaining a position in spaced relation and out of contact with said wheel and being operative to abrade the work piece from the straight surface of its first section to a second section thereby to form in the work piece a taper from said straight surface to said second section.

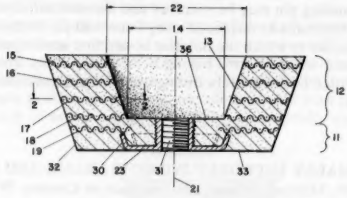
3,896,593

REINFORCED BONDED ABRASIVE CUP WHEEL

James C. Rine, North Tonawanda, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,969
Int. Cl. B24d *7/04*
U.S. Cl. 51—209 R **12 Claims**

1. A bonded abrasive grinding wheel having a back portion and an annular diverging rim portion, the diverging rim portion being integrally formed with the back portion; the diverging rim portion having a diverging frusto-conical inner surface, the smaller diameter of the diverging frusto-conical inner surface being adjacent the back portion of the grinding wheel; wherein the improvement comprises the provision of at least one substantially flat annular reinforcing strip of woven filamentary material having therein interstices for penetration with binder material of the grinding wheel, within the diverging rim portion of the grinding wheel, the annular reinforcing strip being substantially perpendicular to the axis of the frusto-



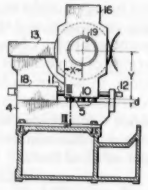
conical inner surface of the diverging rim portion, and the inner diameter of the annular-reinforcing strip being less than the maximum diameter of the diverging frusto-conical inner surface of the diverging rim portion of the grinding wheel; wherein the annular reinforcing strip includes a pair of end portions, the end portions being disposed in overlapping relationship.

3,896,594

ROLL GRINDING DEVICE INCLUDING CHOCK POSITIONING MEANS

Yasuo Sakai, Numazu, Japan, assignor to Toshiba Machine Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 202,770, Nov. 29, 1971, abandoned. This application Nov. 27, 1973, Ser. No. 419,451
Int. Cl. B24b *41/06*
U.S. Cl. 51—236 **4 Claims**



1. A roll grinding device for a roll supported by chocks, said device comprising: a plurality of movable supporting pins for supporting the chocks, said pins having sloped lower faces, a plurality of movable wedges having sloped upper faces adapted to mate with the sloped faces of said supporting pins for determining the vertical positions of said supporting pins, means for moving said wedges and for limiting the moving force to a value less than that which can lift the total weight of the roll and said chocks at said supporting pins, and means for engaging the peripheral face of the roll near said chocks and for urging the roll to a grinding position, thereby fixing the position of the roll within the chocks.

3,896,595

HATCHWAY

Joseph R. Anghinetti, Kennebunkport, and Paul A. Couture, Emery Mills, both of Maine, assignors to Wasco Products, Inc., Sanford, Maine

Filed May 21, 1971, Ser. No. 145,779
Int. Cl. E04d *13/035*
U.S. Cl. 52—19 **3 Claims**

1. A roof access hatch comprising:

side wall means including a curb defining an enclose[4] hatchway;

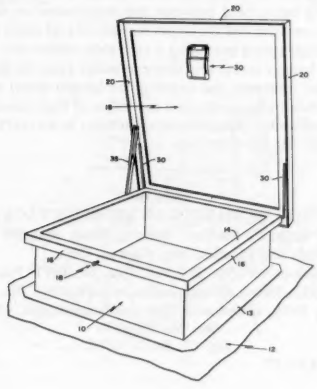
a cover hinged to one end of said sidewall means exteriorly of said hatchway for movement between open and closed positions;

means counterbalancing said cover towards said open position;

a latching handle pivotally suspended from the inside of said cover adjacent the unhinged end thereof, said latching handle being adapted to depend freely downwardly therefrom in a substantially vertical direction;

a transversely extending bar secured to said latching handle between the ends of said handle;

catch lug means secured to said sidewall at a location adapted to be engageable with said transversely extending bar when said cover is pivoted to said closed position thereof, said catch lug projecting slightly inwardly from



said sidewall, said catch lug including an upper edge located to be engaged by said bar, said edge having a downwardly and inwardly extending configuration thereby to guide said transverse bar inwardly and downwardly over the free end of said lug means while said cover is closing, said catch lug means having a lower surface adapted to enable said transverse bar and latching handle to swing back toward its vertically depending attitude and to enable said transverse bar to be disposed beneath said lower surface of said lug means; and

means forming a hole in said latching handle and said catch lug means respectively, said holes being registerable when said transverse bar is in engagement with the inside of said catch lug means to enable a supplemental lock to be passed through said registered holes.

3,896,596

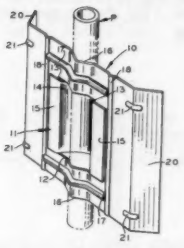
ANCHOR PLATE FOR FENCE POST

Donald E. Berger, 3004B Barclay Square, N., Columbus, Ohio 43209

Filed May 23, 1974, Ser. No. 472,610
Int. Cl.² E04H *17/22*
U.S. Cl. 52—153 **17 Claims**

1. An anchor plate for posts set in earth comprising

a rigid sheet metal plate adapted to be driven edgewise into the earth in a vertical plane adjacent a side of a post and including a central area having an aperture formed therein, said aperture having side edges spaced apart a distance commensurate with the diametrical dimension of a post disposed in longitudinal alignment therewith; and a U-shaped bracket positionable in said aperture for encircling a post in cooperation with said plate, said bracket having spaced legs that extend through said aperture when said bracket is assembled with said plate and terminate in laterally outward projecting flanges which



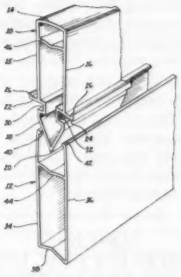
overlie respective surface portions of said plate adjacent said aperture side edges.

3,896,597

CONCRETE EXPANSION AND CONTRACTION JOINT

Max W. Deason, 5350 N. Estelle Dr., Tucson, Ariz. 85718

Filed Apr. 4, 1974, Ser. No. 457,964
Int. Cl.² E01C *11/10*
U.S. Cl. 52—396 **3 Claims**



1. A concrete expansion/contraction joint comprising:

a. an elongated upper section having a top wall and two side walls depending from said top wall;

b. a pair of water blocking anchors each extending outwardly from a side wall and longitudinally along said side wall; means forming longitudinally extending channels in each of said side walls beneath said water blocking anchors;

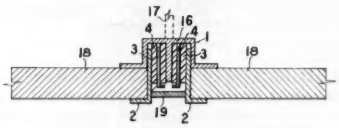
c. a bottom joining said side walls, said bottom including means for inducing a contractual crack; and

d. an elongated lower section having two side walls, a bottom wall and an open top; a pair of longitudinally extending inwardly directed locking flanges positioned adjacent said open top, engaging said longitudinally extending channels to lock said upper and lower sections together and enclosing said contractual crack inducing means to form a unitary structure; said upper and lower sections when embedded in concrete being inseparable.

3,896,598
DEVICE FOR FIXEDLY CONNECTING PANELS FOR USE IN BUILDING

Tsukasa Yoshida, Fuchu, Japan, assignor to Tsukasa Yoshida, Fuchu, Japan

Filed Aug. 8, 1974, Ser. No. 495,871
Int. Cl.[2] E04B 2/72
U.S. Cl. 52—498 10 Claims

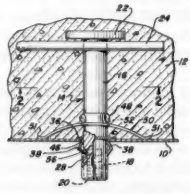


10. An adjustable device for securing panels of varying thickness in a building structure, each of said panels having parallel front and back surfaces and a longitudinal edge surface extending perpendicularly therebetween defining the panel thickness, and longitudinal front and back marginal edge portions on said front and back surfaces, respectively, adjacent said longitudinal edge surface and extending laterally inwardly therefrom, the device comprising: a coupling member having at least one rectangular, smooth-sided longitudinal groove therein and a substantially rigid, flat lateral surface extending laterally from the open end of said longitudinal groove and parallel to the plane of said panel, said lateral surface facially contacting said back panel surface along said back marginal edge portion; and L-shaped holder member having a substantially rigid smooth-sided first leg being adjustable receivable within said groove and a substantially rigid second leg extending normally therefrom parallel to both said front surface of said panel and said flat lateral surface, said second leg having a face portion defined by the inside surface of the normally extending leg, facially contacting said front surface of said panel along said front marginal edge portion, said face portion and said flat lateral surface defining a closely fitting slot, said holder member holdably securing said panel in said slot along said front and back marginal edge portions of said panel; a retaining plug insertable in said groove to a depth below the surface of said panel, and a wedge insertable in said plug to expand said plug against said first leg of said holder member within said groove, thus retaining said holder member in said groove to secure said slot around said panel edge and marginal edge portions.

3,896,599
HANGER INSERT FOR STEEL FLOOR DECK

Frank A. Werstein, Long Beach, and William R. Barnes, Highland, both of Ind., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 214,226, Dec. 30, 1971, abandoned. This application Aug. 2, 1973, Ser. No. 384,968
Int. Cl.[2] G09F 7/18
U.S. Cl. 52—704 22 Claims



1. A hanger insert for installation in decking including a layer of concrete and a sheet member supporting the concrete prior to its being poured, the insert comprising:

A. an elongate metal member having a bottom end and a top end with stop means located therebetween,

B. means for supporting said elongate metal member in a disposition passing through a hole in a sheet member which is adapted to have concrete poured onto the upper surface of the sheet member, with the bottom portion of the elongate metal member protruding below the sheet member and the top portion of the elongate metal member protruding above the sheet member,

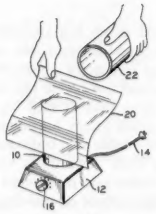
C. said elongate metal member including structure to enable the securement of a structural member from the bottom portion thereof which structural member is adapted to depend from the decking to be formed, and

D. a leaf spring formed of flat spring stock bowed about a central area and loosely mounted through said central area on said elongate member to have its concave surface facing the lower portion of the elongate member, said leaf spring being held between the stop means on said elongate member and the upper surface of said sheet member, said leaf spring providing a yieldable connection between said hanger insert and sheet member prior to the setting of said concrete and enabling the hanger insert to absorb the shock attendent upon the influx of fluid concrete and to restore the elongate metal member to an erect position before the concrete sets.

3,896,600
METHOD OF MAKING AN ADDITIVE PACKAGE

Malcolm Scott C. McVay, Aurora, Ohio, assignor to U.S. Chemicals and Plastics, Inc., Canton, Ohio

Division of Ser. No. 210,018, Dec. 20, 1971, Pat. No. 3,784,005, which is a continuation-in-part of Ser. No. 10,316, Feb. 10, 1970, abandoned. This application Sept. 13, 1973, Ser. No. 397,154
Int. Cl. B65b 43/08
U.S. Cl. 53—27 6 Claims



1. A method of forming a package for additives comprising a sealed envelope of thin synthetic organic polymeric material contained within a rigid container open at one end and having a longitudinal inner surface and an end wall at the other end, including the steps of:

loosely draping a sheet of said polymeric material across the end of a mandrel having a longitudinal outer surface and a cross section complementary to and closely conforming dimensionally with the longitudinal inner surface and cross section of said rigid container, said mandrel end alone supporting said draped sheet,

sliding the open end of said rigid container axially onto said mandrel for said rigid container and mandrel alone to cooperatively randomly fold and form said sheet therebetween into engaging conformity with the longitudinal inner surface and end wall of said rigid container, said sheet being of a size for said forming to produce flaps protruding axially beyond said open end of said rigid container,

removing said rigid container with said formed sheet therein from said mandrel,

introducing at least one additive into said formed sheet in said rigid container, and

sealing said protruding flaps to close said formed sheet and define said envelope.

3,896,601

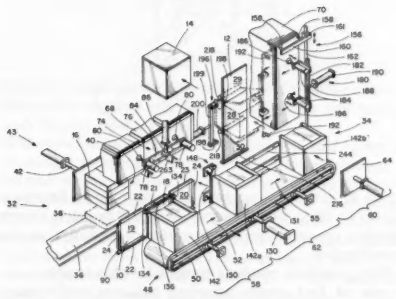
PACKAGING MACHINE USING TWO-BLANK CARTON SYSTEM

James L. Vickers, Harbert, Mich., and Edmund A. Waycie, River Forest, Ill., assignors to Stone Container Corporation, Chicago, Ill.

Continuation-in-part of Ser. Nos. 285,211, Aug. 31, 1972, Pat. No. 3,817,018, and Ser. No. 446,124, Feb. 27, 1974, Pat. No. 3,872,650. This application June 17, 1974, Ser. No. 480,160

Int. Cl. B65b *11/18*

U.S. Cl. 53—32 **23 Claims**



23. A method for forming a sealed package containing lading from a generally rectangular body blank of paperboard material and a generally rectangular cover blank of paperboard material, the body blank including a center panel, alternate, hingedly connected side panels and flanges hingedly connected along the longitudinal edges of the center and side panels and along the ends of the side panels, and the cover blank including a center panel and alternate hingedly connected side panels, said method including the steps of positioning the body blank in a generally vertical plane adjacent the outlet of a lading moving station; moving a quantity of lading horizontally in one direction and against the body blank; folding the body blank into a generally U-shaped formation partially surrounding the lading with the panels lying in generally vertical planes and with the center panel forming an end wall and the side panels forming two side walls of the formation as the lading is moved from the lading moving station; folding the flanges along each longitudinal edge of the body blank to positions generally perpendicular to the associated side walls and end wall during movement of the lading against the body blank; folding the end flanges to positions generally perpendicular to the associated side walls; moving the folded body blank and lading in direction laterally of said one direction to a discharge station, positioning the cover blank in a generally vertical plane adjacent the discharge station, moving the folded body blank and lading in a third direction laterally of said second direction and against the cover blank; folding the cover blank into a U-shaped formation partially surrounding the lading with the margin of the cover blank positioned overlying the flanges of the folded body blank as the folded body blank formation is moved against said cover blank and securing the flanges of the body blank to the adjacent facing margin of the cover blank.

3,896,602

METHOD OF MANUFACTURING OF A BARRIER PACKAGE

Tor H. Petterson, 31248 Palos Verdes Dr. West, Palos Verdes Peninsula, Calif. 90274

Continuation-in-part of Ser. No. 180,790, Sept. 15, 1971, abandoned. This application Aug. 1, 1973, Ser. No. 384,738

Int. Cl. B65b *31/00*

U.S. Cl. 53—36 **10 Claims**

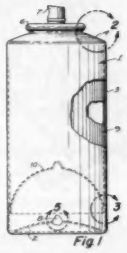


Fig. 1

1. The method of making a barrier package containing a propellant separated from a product to be dispensed, comprising the steps of:

a. forming a container having first and second walls and an intermediate wall extending therebetween;

b. covering at least about one-half of the inner surface of said container, including said second wall, with a substantially impermeable continuous coating in intimate contact with said inner surface;

c. adhesively bonding and sealing said coating to said inner surface, at least throughout substantially all of the area thereof covering said intermediate wall, the strength of said bond being less than the tensile strength of said coating;

d. placing a charge of product, less than the internal volume of said container, through said first wall and inside said coated container;

e. introducing a propellant through said second wall to separate an initial portion of said coating therefrom and push said separated coating toward said first wall, until said product and propellant substantially fill said container while leaving the remainder of said coating bonded to said container whereby permeation of product or propellant through said coating cannot occur through the bonded remainder thereof during shelf storage and whereby progressive release of product through said first wall will progressively strip said remainder of said coating from said intermediate wall and thereby control the permeability potential of said coating.

3,896,603

FILM STRIP JACKET SYSTEM AND EQUIPMENT

Stanley D. Tout, Arcadia, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 8, 1974, Ser. No. 431,644

Int. Cl. B65b *43/26*

U.S. Cl. 53—123 **13 Claims**

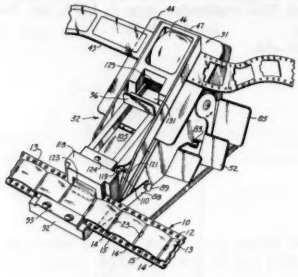
1. In apparatus for inserting a transparency at a loading station into a pocket formed by essentially transparent interconnected first and second strips, the improvement comprising in combination:

first means for releasably retaining said strips at said loading station, said first means including means for releasably retaining an edge portion of said first strip;

actuable second means for spacing said second strip from said first strip whereby to open said pocket for an insertion of said transparency;

actuable third means separate from said second means for advancing said transparency into said open pocket, said

third means including transparency inserting means and means for guiding at least a portion of said transparency inserting means over said edge portion retaining means; and



fourth means coupled to said second and third means for actuating said second and third means.

3,896,604

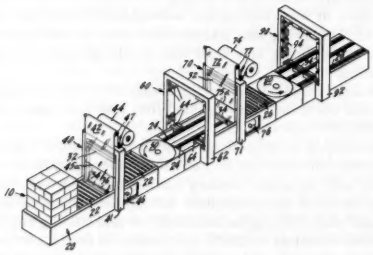
DOUBLE WRAP PACKAGING APPARATUS

Daniel Richard Marantz, Port Washington, N.Y., assignor to American Can Company, Greenwich, Conn.

Filed Mar. 1, 1973, Ser. No. 337,171

Int. Cl.[2] B65B *11/58, 53/02*

U.S. Cl. 53—176 **10 Claims**



1. Apparatus for wrapping and consolidating a load in the form of a rectangular prismatic stack of cartons comprising means to advance the load, means for establishing a curtain of a first heat sealable, heat shrinkable plastic film in a plane through which plane the load may be advanced to wrap the first film about the leading, top and bottom faces of the load, means to draw the film across the trailing face of the load, means to clamp the first film together across said trailing face, means to heat seal the film in the clamped portion along spaced parallel lines of heat sealing, means to sever the film between the heat sealed lines, means to establish a curtain of a second heat sealable, heat shrinkable plastic film in a plane, means to orient the load with respect to the plane of said second film, means to advance the load through the curtain of said second film to wrap the second film about the top, bottom and the two faces not covered by the first film, means to draw the second film across the now trailing face of the load, means to clamp the second film together across said now trailing face, means to heat seal the second film in the clamped portion along spaced parallel lines of heat sealing, means to sever the second film between the heat sealed lines, at least one of said first and second films extending beyond the edges of the faces of the prism wrapped by that film, and means to heat shrink both films and to heat laminate the films together where they overlap.

3,896,605

AUTOMATIC DEVICE FOR PRESENTING BAGS ONTO A BAGGING MACHINE PREVIOUS TO THE CLOSING OF SAID BAGS

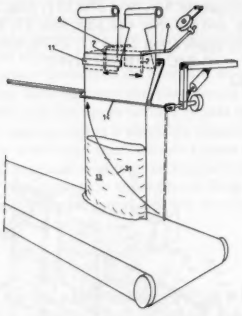
Marcel Chevalier, Uriage, France, assignor to Etablissements M. Chapais, France

Filed Apr. 2, 1973, Ser. No. 347,167

Claims priority, application France, May 12, 1972, 72.17734

Int. Cl. B65b *7/06*

U.S. Cl. 53—266 **9 Claims**



1. An apparatus for guiding and controlling a flexible container to be filled, and then moved to and properly presented to another apparatus for a subsequent operation, comprising, in combination:

a filling machine machine provided with a spout;

a pair of first means arranged adjacent said spout and adapted to be disposed together with at least a portion of said spout into an aperture of said flexible container;

second means operatively connected to said pair of first means for selectively causing said first means to move toward and away from each other;

third means disposed beneath said pair of first means and adapted for engagement with a predetermined side of said flexible container;

fourth means initially disposed adjacent said predetermined side of aid flexible container and substantially opposite said third means, and adapted to be selectively moved to a position adjacent a side of said flexible container which is substantially opposite to said predetermined side so that said flexible container may be pressed between said third means and said fourth means; and

fifth means operatively connected to said first, second, and fourth means for automatically controlling the motions of said fourth means in synchronism with the motions of said pair of first means,

whereby said aperture of said flexible container is moved and held to a desired open position for filling by said pair of first means, and said flexible container is held and guided between said third and fourth means while said flexible container is being moved toward said other apparatus for said subsequent operation.

3,896,606

DEVICE FOR INSERTING RECORDING TAPE CASSETTES IN CASES

Yoshikazu Utsumi, 47 Higashiura-cho Daigo Misasagi, Fushimi-ku, Kyoto, Kyoto Pref., Japan

Filed July 3, 1973, Ser. No. 376,198

Claims priority, application Japan, July 3, 1972, 47-66790

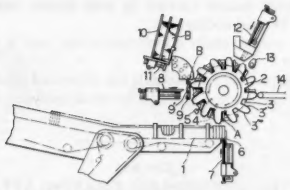
Int. Cl. B65b *5/04, 7/26, 25/00*

U.S. Cl. 53—266 **4 Claims**

1. A device for inserting cassettes and a description thereof in a casing comprising a lid pivotally mounted on a receptacle

said lid including an end wall and a pocket formed therein and said receptacle including a notch formed therein, said device comprising:

a. turret disc means comprising a plurality of concavities for receiving said casing and for carrying said casings, each concavity comprising a straight wall and an inclined wall;
b. first pusher means for inserting said casings into said turret disc means;
c. keep plate means extending into each of said concavities for engaging the end wall of said casing lid through the notch formed in said receptacle thereby holding said lid against said straight wall of said concavity;



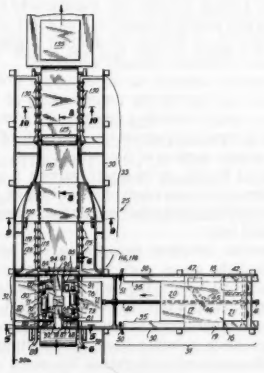
d. opening means positioned with respect to said turret disc means for moving said receptacle against said inclined wall thereby opening said lid;
e. first insertion means positioned relative to said turret disc means for inserting said description into said casing;
f. second insertion means positioned relative to said turret disc means for inserting said cassettes into said casing;
g. closing means, positioned relative to said turret disc means, for closing said lid after said description and said cassette have been inserted into said casing; and
h. discharge means positioned relative to said turret disc means for discharging said casings therefrom.

3,896,607

APPARATUS FOR MOUNTING A LID ON A CONTAINER

Thomas B. Royal, Homestead, Fla., assignor to International Paper Company, New York, N.Y.

Filed Jan. 9, 1974, Ser. No. 432,047
Int. Cl. B65b *7/28*
U.S. Cl. 53—287 **8 Claims**



1. An apparatus for applying to a filled container a lid, which includes a central portion having opposed side flaps and end flaps foldably connected to said central portion, which comprises:

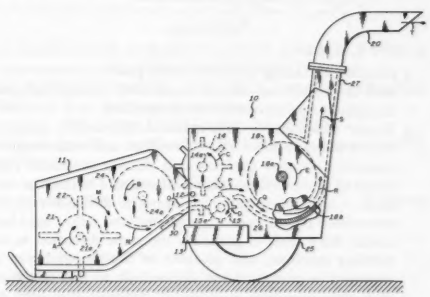
a. a frame;
b. a reciprocable mandrel mounted on said frame;
c. means for reciprocating said mandrel;
d. a pair of squeezer plates pivotally mounted on opposite sides of said mandrel;
e. means for positioning a container below said mandrel;
f. means for depositing an adhesive so as to be disposed between said end flaps and the end walls of said container when said lid is mounted on said container;
g. means mounted on said mandrel for moving said squeezer plates into parallel relation with each other whereby downward movement of said mandrel holds said lid on said container while said squeezer plates compress the end flaps of said lid against said container;
h. means for laterally moving said container after the end flaps of said lid have been secured thereto; and
i. means for securing said side flaps to said container while said container is moving laterally.

3,896,608

STATIC MAGNETIC FIELD METAL DETECTOR

William L. Garrott, Gainesville, Fla., assignor to Sperry Rand Corporation, New York, N.Y.

Filed June 25, 1973, Ser. No. 373,565
Int. Cl. A01d *69/10*
U.S. Cl. 56—10.2 **8 Claims**



1. In a crop harvester having rotatable machine elements including crop processing elements susceptible to damage by a tramp metal part moving through a crop input region toward said crop processing elements, the combination comprising:

first and second elongate magnetic field generation means for producing respective first and second unidirectional magnetic fields in discrete portions of said crop input region,

said first magnetic field being opposite in sense to said second magnetic field and of substantially equal strength,

multiple conductor magnetic field pick-up coil means disposed substantially equally in stationary relation in said first and second unidirectional magnetic fields for providing a detection signal in the presence of said object adjacent said first or said second elongate magnetic field generation means while affording substantial cancellation of spurious magnetic field responses, and

utilization means coupled to said multiple conductor magnetic field pick-up coil means.

3,896,609

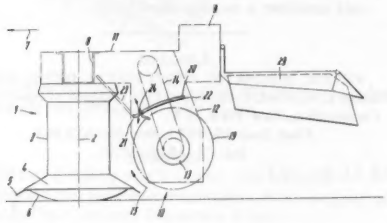
MOWING MACHINE

Albert Overesch, Rheine, Germany, assignor to Maschinenfabriken Bernard Krone GmbH, Spelle, Germany

Filed Oct. 26, 1973, Ser. No. 410,249
Int. Cl. A01d *35/26*
U.S. Cl. 56—13.6 **16 Claims**

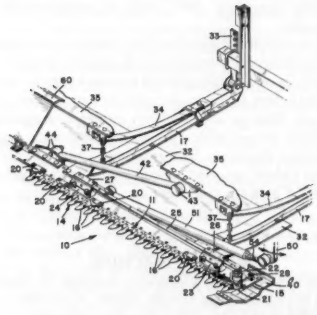
1. A mowing machine adapted to move over the ground, comprising in combination,

a machine frame;
a supporting beam mounted on said machine frame;
at least two mowing devices operatively mounted on said supporting beam in coacting pairs which are adapted to rotate around general vertical axes in mutually opposite directions; said mowing devices being arranged on said supporting beam transversely relative to the direction of movement of said mowing machine and define feed gaps therebetween;
a post-treatment arrangement for the harvest material which has been cut by said mowing devices is operatively connected behind said supporting beam relative to the direction of movement of said mowing machine;
said post-treatment arrangement comprises a substantially horizontal drive shaft rotatably mounted on said machine frame substantially parallel to said supporting beam;



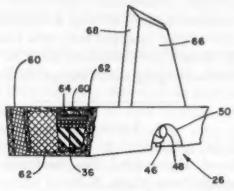
a plurality of flailing members freely pivotally connected to said drive shaft, so that the outer ends thereof describe a maximum operative circumference; and
a fender mounted on said machine frame at a predetermined distance from said drive shaft and extending substantially parallel thereto; said flailing members being adapted to move immediately above said horizontal drive shaft in a direction generally opposite to the direction of movement of said mowing machine and below said horizontal drive shaft in generally the same direction as said mowing machine; said plurality of flailing members are arranged in groups on said drive shaft, so that one group of flailing members is mounted opposite said feed gap between a pair of coacting mowing devices.

3,896,610
FLOATING SICKLE BAR MOWER
Kenneth S. Hiniker, P.O. Box 3044, Mankato, Minn. 56001
Filed Mar. 4, 1974, Ser. No. 447,738
Int. Cl. A01d *55/26*
U.S. Cl. 56—15.8 **1 Claim**



1. In a harvester having a frame, a drive member, and power means for causing transverse oscillatory motion of said drive member with respect to said frame:
a mower structure including a mower bar, a sickle bar having a driving connection at one end thereof and reciprocable with respect to said mower bar, and ground contacting means for normally supporting at least a portion of the weight of said structure;
means connecting said mower structure to said frame for propulsion therewith, while providing for limited generally vertical movement of said mower structure to effectuate said ground support, so that the distance between said drive member and said sickle bar is not constant;
a sliding link connected at one end to said driving connection of said sickle bar and extending along said mower bar;
spaced guide means carried by said mower bar and traversed by said sliding link;
a pitman arm pivotally connected at one end to said drive member;
and means pivotally connecting the other end of said pitman arm to said sliding link at a location between said guide means.

3,896,611
POWER TRANSMISSION BELT HAVING ATTACHED VEGETATION ENGAGING ELEMENTS AND METHOD
Guy E. Lingenfelter, Broomfield, and William M. Haines, Englewood, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.
Filed June 8, 1973, Ser. No. 368,425
Int. Cl.[2] A01D *45/02, 55/24*
U.S. Cl. 56—119 **16 Claims**



1. A power transmission belt for vegetation processing comprising:
an endless belt operable in a longitudinal direction including a strain-resisting tensile section and a compression section having at least one transversely disposed notch therein and having attached at a plurality of spaced points along the outer surface of the belt vegetation engaging elements which individually comprise:
a protruding element having an upper work portion and a base portion on the outer surface of the belt and a stem rigidly extending downwardly from the base portion of the work portion into the body of the belt below the tensile section of the belt;
said stem having at its lower portion a seat positioned within said transversely disposed notch formed on the undersurface and solely within the compression section of said belt;
a retention member engaged in the seat and biased against the upper portion of said notch with a force sufficient to place the belt section lying between said base portion of the protruding element and the retention member under substantial compression;
said retention member having a longitudinal dimension small compared with that of the notch measured at its widest point at its opening with the undersurface of the belt, thereby defining a substantial clearance therebetween so as to permit substantially free flexing of the belt about the retention member;
whereby during operation of the belt said vegetation element and said belt at each transverse notch are permitted

to undergo limited relative movement about an effective pivot area transverse of the belt formed at the upper portion of the notch.

3,896,612

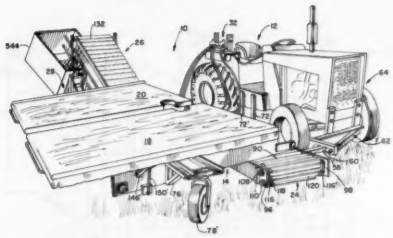
FRUIT HARVESTER

Carl Manning McHugh; Byron Kenneth Webb, and Clarence Elam Hood, Jr., all of Clemson, S.C., assignors to Research Corporation, New York, N.Y.

Filed Nov. 14, 1973, Ser. No. 415,733

Int. Cl. A01g *19/08*

U.S. Cl. 56—329 **6 Claims**



1. A fruit tree harvester comprising a generally quadrangular main frame; a fruit catching and collecting bed carried by said main frame; said catching and collecting bed comprising, a half frame generally coextensive in size to said main frame and attached thereto for limited lateral sliding movement and a pair of quarter frames each extensible laterally in respect to the main frame, each of said quarter frames comprising a bed frame and a catcher bed, said catcher bed of each quarter frame being movable longitudinally in respect to the main frame and the bed frame, means coacting between the main frame and the half frame for laterally moving the half frame and the pair of quarter frames relative to the main frame from a transport position overlying the half frame to an extended outwardly position on either side of a tree to be harvested; further means for moving said pair of quarter frames from the outwardly extended position to a position with the outward edges of the pair of quarter frames pitched upwardly; said means for moving the pair of quarter frames from the transport position to the extended outwardly position includes means for urging the catcher beds longitudinally with respect to their respective bed frames as the quarter frames approach the most extended positions, and means for transporting fruit caught by said half frame and pair of quarter frames to a collection zone.

3,896,613

IMPLEMENTS FOR THE DISPLACEMENT OF CROP OR LIKE MATERIAL LYING ON THE GROUND

Ary van der Lely, 10, Weverskaile, Maasland, Netherlands

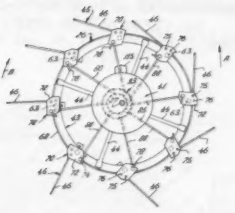
Filed July 12, 1973, Ser. No. 378,637

Claims priority, application Netherlands, July 13, 1972, 7209663

Int. Cl. A01d *79/00*

U.S. Cl. 56—370 **44 Claims**

1. A raking implement for displacing crop lying on the ground comprising a mobile frame and at least one rake device supported on the frame, said device being rotatable on shaft means about a non-horizontal axis and having rake elements that are movable into alternative crop working positions with respect to said axis, steering means on said implement connected to said elements to move the same, said steering means being adjustable to a more or less eccentric position relative to said axis, said steering means comprising an adjustable member that is movable to vary the magnitude of its eccentricity relative to said axis and said steering member being turnable to change its angular location around said axis to vary the phase of maximum eccentricity of said steering member during each rotation of the rake device, whereby the



working positions of said rake elements can be changed during each revolution, locking means associated with said steering means for maintaining any chosen setting of the magnitude or phase eccentricity of said member.

3,896,614

BALANCE-COCK-AND-REGULATOR ASSEMBLY FOR A TIMEPIECE MOVEMENT

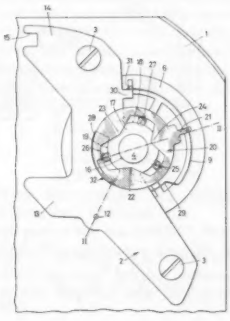
Peter Bachmann, Bettlach, Switzerland, assignor to Ebauches Bettlach S.A., Bettlach, Switzerland

Filed May 21, 1974, Ser. No. 471,989

Claims priority, application Switzerland, June 8, 1973, 8381/73

Int. Cl. G04b *17/14*

U.S. Cl. 58—109 **8 Claims**

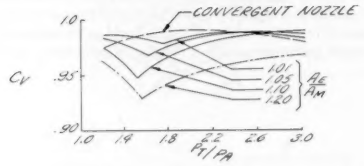


1. A balance-cock-and-regulator assembly for a timepiece movement, comprising: a balance cock having an opening for receiving a bearing secured into said opening and arcuate edge portions concentric to said opening, said edge portions having a radius greater than that of said bearing; and a regulator cooperating with a hairspring and having a profiled opening defining several tongues, some of said tongues engaging said edge portions on one side of said cock whereas the other tongues engage said edge portions on the other side of said cock, thus constituting pivoting means for said regulator on said balance cock.

3,896,615
GAS TURBINE ENGINE FOR SUBSONIC FLIGHT

Martin S. Slatkin, Manchester; David L. Motycka, Glastonbury, and Vincent J. Disabato, Southington, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Continuation of Ser. No. 330,792, Feb. 8, 1973, abandoned. This application Oct. 4, 1974, Ser. No. 512,286
Int. Cl.[2] F02K *3/06, 1/24*
U.S. Cl. 60—204 **3 Claims**



3. The method of operating a turbofan engine on takeoff wherein the engine has a fan exhaust nozzle including the steps of:

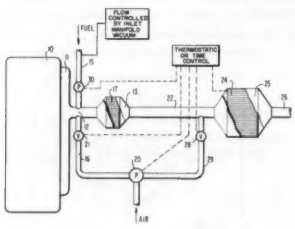
maintaining a pressure ratio below the critical pressure ratio across the exhaust nozzle; and

maintaining an area ratio between the nozzle exit area (A_E) and the nozzle minimum area (A_M) which is greater than 1.0 but less than or equal to 1.1.

3,896,616
PROCESS AND APPARATUS

Carl D. Keith, Summit, and John J. Mooney, Wyckoff, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Filed Apr. 21, 1972, Ser. No. 246,174
Int. Cl. F02b *75/10*
U.S. Cl. 60—274 **10 Claims**



1. A method for oxidizing constituents of exhaust gas from an internal combustion engine, said gas containing carbon monoxide, hydrocarbon, and nitrogen oxides which comprises:

passing during start-up of the engine said gas and an excess of molecular oxygen to a first catalyst;

passing effluent gases from said first catalyst to a subsequent catalyst in sequential gas flow relationship with respect to said first catalyst, at least until said subsequent catalyst is at a temperature sufficient to promote the oxidation of carbon monoxide in said exhaust gas;

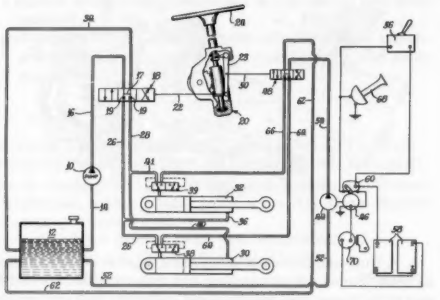
subsequently passing added fuel, molecular oxygen, and nitrogen oxides-containing exhaust gas from the engine to said first catalyst, the fuel being added only when the engine inlet manifold is at an absolute pressure of less than about 20 inches of mercury, the amount of fuel being in excess of that stoichiometrically required to consume said oxygen by oxidation of the fuel and to reduce the nitrogen oxides in said gas; and

passing the effluent gases from said first catalyst and molecular oxygen to said subsequent catalyst to reduce the carbon monoxide and hydrocarbon contents of said gases by oxidation.

3,896,617
STEERING SYSTEM WITH ELECTRICALLY DRIVEN SECONDARY STEERING MEANS

Jack H. Kraina, Aura, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 1, 1973, Ser. No. 411,775
Int. Cl. F15b *20/00;* **B62d** *5/06*
U.S. Cl. 60—403 **10 Claims**



1. A steering system for an earthmoving vehicle comprising; hydraulic fluid supply means, primary pump means, primary fluid communication means including first conduit means for connecting said supply means and said primary pump means, steering motor means, said primary fluid communication means further including second conduit means for connecting said primary pump means to said steering motor means, primary control valve means in said conduit means between said primary pump means and said motor means for controlling the flow of hydraulic fluid to and from said motor means, steering mechanism means for selectively actuating said primary control valve means, selectively manually activated and deactivated secondary pump means, means for selectively manually activating and deactivating said secondary pump means, secondary communication means including third conduit means for connecting said secondary pump means to said fluid supply means, said secondary communication means further including separate fourth conduit means for connecting said secondary pump means to said steering motor means, secondary control valve means in said separate conduit means for controlling the flow of hydraulic fluid to and from said motor means upon selective manual activation and deactivation of said secondary pump means.

3,896,618
SYSTEM FOR PROVIDING AUXILIARY POWER

William E. Smith, Climax, and Charles J. Bowden, Galesburg, both of Mich., assignors to General Signal Corporation, Rochester, N.Y.

Filed May 31, 1974, Ser. No. 475,212
Int. Cl. F15b *20/00, 21/04*
U.S. Cl. 60—405 **7 Claims**

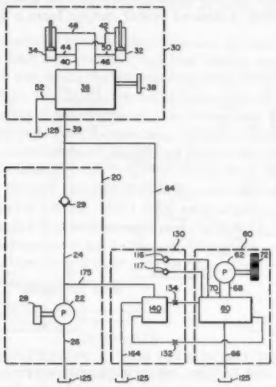
1. A system for providing auxiliary power which comprises:

a primary means including a primary pump, an output line to provide primary power to a work function means, and a return line;

an auxiliary means including an auxiliary pump, an output line to provide said auxiliary power, a return line and a valve means for controlling fluid flow in said output and return lines of said auxiliary means;

a reservoir connected to said primary return line and said auxiliary return line;

a controlled leakage means for cooling said auxiliary pump being connected to said auxiliary means, said reservoir and said primary means and being responsive to fluid



pressure from said primary means for directing a portion of auxiliary output fluid to said reservoir when the primary means provides a predetermined pressure and directing a desired amount of said auxiliary output fluid to said auxiliary output line when said primary means provides less than said predetermined pressure.

3,896,619

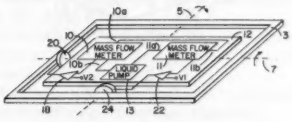
EARTH SPIN AXIS DETECTING PLATFORM USING CORIOLIS ACCELERATION DETECTORS

Joe S. Hunter; Little J. Little, both of Huntsville, and Escar L. Bailey, Athens, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 252,789, May 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 94,706, Dec. 3, 1970, abandoned. This application Apr. 30, 1974, Ser. No. 465,641

Int. Cl.[2] G01C *21/10*

U.S. Cl. 33—300 **5 Claims**



1. An earth spin axis detecting system using a Coriolis acceleration detector system employing two mass flow meter detectors mounted on an earth bound platform, each of said detectors having an input tube and an output tube positioned along a common sensitive axis, with the sensitive axes of each of said detectors being orthogonal; means for causing liquid flow through said mass flow meter detectors in which Coriolis acceleration forces are applied to said liquid circulating in said detectors; a Coriolis acceleration detecting means within each of said two mass flow meter detectors, said detecting means having a signal producing means with an output therefrom whereby an electrical output signal is produced having a magnitude and polarity according to said Coriolis acceleration on each of said detectors; and torquing means having an input electrically connected to said electrical output signal for driving said platform perpendicular to the earth's spin axis and nulling said Coriolis acceleration on said mass flow meter detectors wherein a vector normal to said platform points in a desired north reference direction.

3,896,620

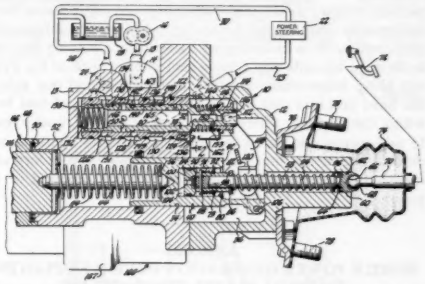
TWO-STAGE ACCUMULATOR VALVE

Donald M. Flory, Arcanum, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 14, 1974, Ser. No. 433,204

Int. Cl. F15b *7/00*

U.S. Cl. 60—547 **3 Claims**



1. In a hydraulic power brake booster assembly including a housing having a pressure chamber therein and a fluid storage accumulator adapted to be connected to a fluid pressure source, an improved valve assembly for controlling the flow of fluid into and out of said accumulator to the pressure chamber comprising: a valve seat member having a valve passage therethrough connecting the accumulator to the pressure chamber; a first valve element normally engaging said valve seat member when in a closed operative position to block fluid flow therebetween and movable against a spring to an open operative position permitting fluid flow; said first valve element having a bleed passage therein extending between the accumulator and the pressure chamber and being aligned with the passage in said valve seat member; a second valve element normally seated against said first valve element to block fluid flow through said bleed passage; operator controlled actuating means supported in alignment with said bleed passage and movable to unseat said second valve element thereby permitting fluid to flow through said bleed passage which flow produces a reaction force on said first valve element tending to move it toward an open operative position.

3,896,621

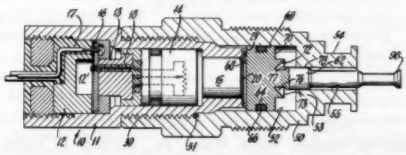
ACTUATING UNIT

Robert H. Sawyer, Bernardsville, N.J., assignor to Cartridge Actuated Devices, Inc., Fairfield, N.J.

Continuation-in-part of Ser. No. 230,837, March 1, 1972, Pat. No. 3,748,413. This application July 20, 1973, Ser. No. 381,321

Int. Cl. F01b *29/08*

U.S. Cl. 60—635 **1 Claim**



1. An actuating unit comprising a piston and cylinder, the piston comprising a head slidable within the cylinder on the interior cylindrical wall thereof and a piston rod projecting from one side of the head and aligned with an opening in an

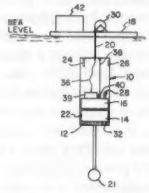
end wall of the cylinder, said opening constituting a guide aperture, said piston rod extending through said aperture and being guided by marginal edges of said aperture, that side of the head remote from the rod constituting a working surface to be subject to a motive force, means for joining said units to an actuating member for producing said motive force, the head of said piston having a metal forming configuration comprising an annular knife edge on that side thereof from which the rod projects, a recess in the rod adjacent said metal forming configuration and defined, at least in part, by a shoulder facing said configuration, deformable means cooperating with said configuration and consisting only of an integral portion of said cylinder end wall, said deformable means being deformable upon impact by said metal forming configuration said configuration including an inclined face leading from the knife edge towards said recess, said interior wall of the cylinder being substantially continuous between said one side of the head and said end wall in an initial position of said head within the cylinder, whereby upon application of motive force to said piston said metal forming configuration deforms said deformable means into said recess whereby said deformable means are constituted as means preventing rebound of the piston.

3,896,622

MOBILE POWER GENERATION DEVICE EMPLOYING TROPICAL WATER THERMOCLINE

George T. Daniello, 15704 Pamela Dr., Silver Spring, Md. 20904

Filed July 22, 1974, Ser. No. 490,845
Int. Cl. F03g *7/06, 7/04*
U.S. Cl. 60—641 **13 Claims**



1. A power generating device comprising:
a medium of variable temperature;
a closed housing in said medium;
energy absorbing means within said housing for absorbing thermal energy from, and rejecting thermal energy to, said medium;
energy conversion means within said housing for converting said thermal energy into useful work; and
means exterior to said housing for relocating said housing within said medium;
whereby said absorbing means absorbs thermal energy from said medium when said housing is in a warm location within said medium and said absorbing means rejects thermal energy to said medium when said housing is in a cool location within said medium and whereupon alternate absorption and rejection of thermal energy by said absorbing means causes said energy conversion means to perform useful work.

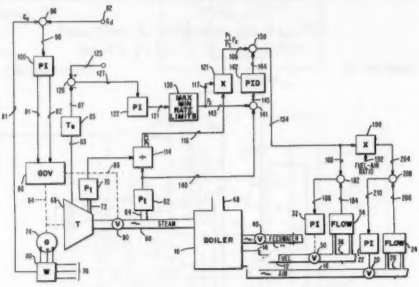
3,896,623

BOILER-TURBINE CONTROL SYSTEM

James H. Daniels, North Wales, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Mar. 6, 1974, Ser. No. 448,602
Int. Cl. F01k *13/02*
U.S. Cl. 60—665 **9 Claims**

1. Apparatus for controlling the inputs to a boiler of a boiler-turbine system in response to a demand signal calculated as the product of a signal representing a setpoint for the pressure of steam supplied by the boiler and a signal representing the ratio of a signal representing the steam flow in the turbine to a signal representing the measured value of said pressure with means for modifying said demand signal until said measured pressure returns to said setpoint and with a control valve for controlling the steam flow to the turbine so as to maintain a desired power output from a generator unit



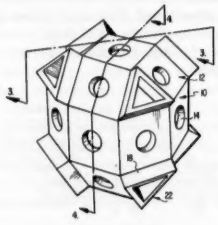
driven by said turbine, wherein the improvement comprises;
means for measuring the temperature in the first stage of the turbine,
means for establishing a desired value for said first stage temperature, and
means operable to modify said pressure setpoint until the measured first stage temperature corresponds to the desired value for the first stage temperature.

3,896,624

POLYHEDRAL, POROUS, AND HOLLOW BLOCK

Dall Chin Chang, Ko Ho, 85 Block, Suhkyo-dong Mapo-Ku, Seoul, South Korea

Filed May 3, 1974, Ser. No. 466,639
Claims priority, application South Korea, May 3, 1973, 719
Int. Cl.[2] E02B *3/04*
U.S. Cl. 61—4 **5 Claims**



1. A polyhedral structural block suitable for use in constructing underwater foundations, having a hollow core and perforated surfaces, comprising in combination:
a. a plurality of flat rectangular first members;
b. a plurality of flat rectangular second members having a pair of flanges extending outwardly at an obtuse angle from a pair of parallel edges thereof, said plurality being twice the number of flat rectangular first members;
c. a first generally annular ring formed from a plurality of alternating first and second rectangular members, the surfaces of each member being at an acute angle to the surfaces of abutting members and the flanges of said second members extending radially and outwardly along the outer perimeter of said ring;
d. a second generally annular ring disposed at right angles to said first ring and having an imaginary axis which

intersects an imaginary axis of the first ring at a point inside said hollow core, said second ring being formed from a plurality of alternating first and second members and having a pair of opposed first members in common with said first ring, the flanges of the second members thereof extending radially and outwardly along the perimeter of the second ring and each flange abutting an adjacent flange on the first ring to form an acute angle therewith;

e. a third generally annular ring disposed at right angles to both said first and second rings and having an imaginary axis which intersects the intersecting axes of said first and second rings, said third ring being formed from a plurality of alternating first and second members and having one pair of opposed first members in common with said first ring and a second pair of opposed first members in common with said second ring, the flanges of the second members thereof extending radially and outwardly along the perimeter of the third ring and abutting adjacent flanges on the first and second rings to form acute angles thereto, whereby a protruberant triangular opening is defined by abutting flanges of the three rings protruding outwardly from said members.

3,896,625

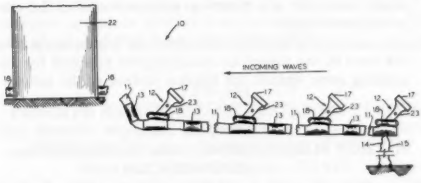
POWER CONVERSION APPARATUS FOR UTILIZING THE FORCE OF WAVES

David K. Lockhart, 805 Watts St., Durham, N.C. 27701

Filed July 5, 1974, Ser. No. 485,956

Int. Cl.[2] E02B *9/08*

U.S. Cl. 61—20 **2 Claims**



1. An apparatus for utilizing the force of waves comprising, in combination:

a. an elongated flexible pipe adapted for placing in the ocean with one discharge end on the shore and an oceanward end at a predetermined distance offshore;

b. cable means for anchoring the oceanward end of said pipe to the ocean floor;

c. a water receiving chamber on the shore having an inlet connected to said discharge end of the pipe and having an outlet for withdrawal of water;

d. a check valve connected to said inlet to prevent discharge of water therethrough from said chamber;

e. a plurality of funnel means spaced in series at predetermined points along the length of said pipe, said funnel means each having an orifice with its axis angled to face toward the incoming waves, a throat portion communicating with said orifice, an open conduit portion communicating with said throat portion at a point intermediate its length and a check valve in said throat portion, the ends of said conduit portion being connected to form a continuation of said pipe at each location of said funnel means;

f. flotation means connected to each said funnel means and being operative to maintain the same properly positioned with respect to said waves; and

g. a plurality of check valves in said pipe, at least one of which is located on the shore side of each funnel means so as to allow flow along said pipe only in the direction of said chamber;

said pipe, valves and funnel means being operative such that under the force of incoming waves, moving water is collected through such funnel means by increments, transferred to said pipe and to said chamber to develop a pressurized storage of water therein available for withdrawal as desired through said chamber outlet as a source of energy.

3,896,626

MINE LINING AND CONVEYOR COMBINATION

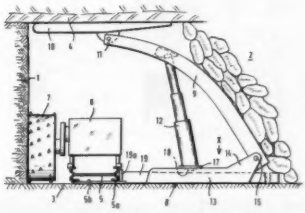
Klaus Spies, Dortmund-Wellinghofen, and Joachim Neeff, Bochum, both of Germany, assignors to Bochumer Eisenhutte Heintzmann & Co., Bochum, Germany

Filed May 18, 1973, Ser. No. 361,623

Claims priority, application Germany, May 19, 1972, 2224438

Int. Cl.[2] E21D *15/44*

U.S. Cl. 61—45 D **8 Claims**



1. In an excavating arrangement, a combination comprising a roof support having a floor-engaging base, a shield pivoted to said base and extending over the same toward the excavation face, a roof-engaging cap pivoted to said shield and extending beyond the same toward the excavation face, and a pit prop extending between said base and said shield; conveyor means extending along the excavation face underneath said cap and also engaging the excavation floor; means for displacing said roof support and said conveyor means relative to one another and sequentially toward the excavation face; and means connecting said roof support with said conveyor means and limiting said displacement of said roof support and of said conveyor means relatively to each other to linear displacement only in direction towards the excavation face while preventing any other relative displacement of said roof support and conveyor means, so that said conveyor means acts as an extension of said floor-engaging base of said roof support and reduces the tendency of the latter to tilt toward the excavation face about said floor-engaging base.

3,896,627

ANCHORING

John Vincent Brown, Granborough, England, assignor to Fosroc A.G., Switzerland

Filed Oct. 23, 1973, Ser. No. 408,688

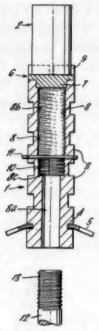
Claims priority, application United Kingdom, Oct. 31, 1973, 50176/73

Int. Cl. E21d *20/02*

U.S. Cl. 61—45 B **6 Claims**

1. A device for use in the fixing of a bolt or the like in a borehole, comprising a generally tubular sleeve including a bore and formed of a compressible plastic material, said sleeve being adapted to be anchored in the borehole by means of a self-setting composition released into location between the sleeve and the borehole wall, the bore of the sleeve comprising a major portion of a first predetermined diameter and a minor portion of a second, smaller, predetermined diameter, said bore portions forming a shoulder at their junction and intermediate the ends of the sleeve, said minor diameter portion including an open end to receive a threaded end portion of a bolt so that said bolt portion can extend therethrough, thread

engaging means located in the major diameter portion and in abutment with the shoulder for engagement with the threaded end portion of the bolt extending through the minor diameter portion, and cap means sealing the major diameter portion of



the bore to prevent the ingress of the self-setting mix therein upon its release to thereby preclude contact between said composition and the threaded end of the bolt extending into said major diameter portion.

3,896,628

MARINE STRUCTURES

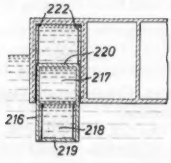
Frode Johan Hansen, Kingswood, England, assignor to Redpath Dorman Long (North Sea) Limited, Bedford, England

Filed Nov. 29, 1973, Ser. No. 420,294

Claims priority, application United Kingdom, Dec. 1, 1972, 55533/72; July 20, 1973, 34679/73; July 20, 1973, 34681/73; July 20, 1973, 34682/73

Int. Cl.[2] E02B *17/00*; E02D *23/16*

U.S. Cl. 61—46.5 **17 Claims**



1. A maritime assembly for disposal on a sub-aqueous bed, comprising a foundation raft to be founded on the bed, and a tower structure to project upwardly therefrom when founded, in which one of the foundation raft and the tower structure has a socket portion and the other has a corresponding spigot portion for engagememt therewith, and there are on the base of the foundation raft three units, each having two vertically spaced chambers, the lower of which chambers contains particulate material and there are means to remove particulate material from the lower chambers, whereby the raft can be lowered towards the seabed by displacement of the particulate material.

3,896,629

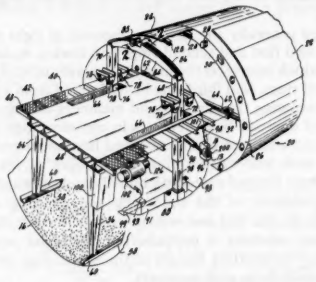
TRAILING SERVICE VEHICLE

Richard W. Stevens, Oconomowoc, Wis., assignor to Milwaukee Boiler Manufacturing Co., Milwaukee, Wis.

Filed July 29, 1974, Ser. No. 492,986

Int. Cl. E01g *5/00*

U.S. Cl. 61—85 **24 Claims**



1. A service vehicle suitable for trailing connection to a tunneling shield within a tunnel having segmented hoop-like ribs forming a portion of a liner, said vehicle comprising:

a horizontal platform positionable within the tunnel, one end of said platform having means for pivotal supportive connection to the rear end of said tunneling shield, the other end of said platform having means for supporting said platform from said tunnel, said platform having a pair of spaced slots lying parallel to the bore to the tunnel;

expander means movably mounted in said slots, said means being extensible in a direction perpendicular to the axis of the tunnel; and

means connected between said expander means normal to the bore of the tunnel for receiving the ribs and for expanding same against the interior surface of the tunnel.

3,896,630

METHOD FOR STARTING A ^{3}He-^{4}He DILUTION REFRIGERATOR

Adrianus Petrus Severijns, and Frans Adrianus Staas, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 14, 1973, Ser. No. 340,953

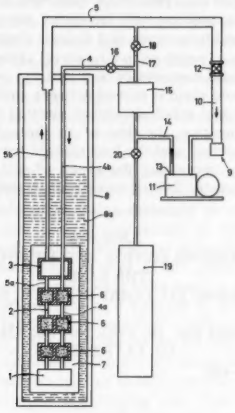
Claims priority, application Netherlands, Mar. 17, 1972, 7203556

Int. Cl. F25d

U.S. Cl. 62—56 **2 Claims**

1. A method of starting a device for transporting heat from a lower level to a higher level, both levels being below the λ temperature of helium, this device including: a cryostat whose walls define therein a vacuum space, and surrounding said space a first chamber for liquid helium, and within said vacuum space a mixing chamber with inlet and outlet means, a first evaporation reservoir with inlet and outlet means, a connection duct betwcen the mixing chamber outlet and the evaporation reservoir inlet, and an inlet duct having a first part within said vacuum space in heat exchange with said connection duct and discharging in said mixing chamber inlet, and within said first chamber an outlet duct connected to said evaporation reservoir outlet and a second part of said inlet duct leading to said first part, the device further comprising a second reservoir containing a ^{3}He-^{4}He mixture and pumping means having inlet and discharge means, an auxilliary reservoir intermediate the pump discharge and second part of the inlet duct, and the pump inlet communicating with said evaporation reservoir, the method comprising the steps of: introducing a quantity of liquid helium into said first chamber of said cryostat, communicating said second reservoir with said second part of the inlet duct within said first chamber, and thereby flowing ^{3}He-^{4}He mixture in said second part and

condensing said mixture therein, pumping gas from said pump outlet duct to said auxilliary reservoir, communicating gas from said auxilliary reservoir to said second part of the inlet duct for condensation therein according to the condensation step above, repeating the condensation steps, starting the



refrigeration process by communicating said pump inlet with said outlet duct and said pump discharge with said second part of said inlet duct, whereby the pump now draws richly concentrated gas mixture and feeds same to the inlet duct where it is subjected to a phase transition in the mixing chamber to ^{3}He-poor phase, and thus produces refrigeration.

3,896,631

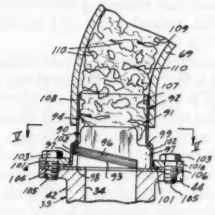
CRACKED ICE MAKER AND TRANSPORT SYSTEM

John Franklin Morrison, St. Paul, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 7, 1974, Ser. No. 512,526

Int. Cl. F25c *1/14*

U.S. Cl. 62—71 **10 Claims**



1. A cracked ice maker comprising,

an upright auger type ice generating means wherein a rotating auger removes ice flakes formed on an adjoining refrigerated chamber wall and advances the ice flakes axially upward,

a compaction means including an extrusion passage arranged to receive the upward advancing ice flakes and to compress and form said ice flakes into a dehydrated solid column of hard ice,

a cracking knife means associated with said extrusion passage and positioned relative thereto to reduce the solid column of hard ice into random cracked ice particles,

a partial-compaction means associated with the extrusion passage and positioned downstream of the knife means, wherein the cracked ice particles are compacted into a loosely-knit cohesive column of ice particles; and

a delivery conduit positioned downstream of said partial-compaction means to afford transport of the cohesive column of ice particles to a point of use.

3,896,632

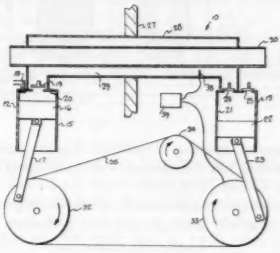
AIR CYCLE HEATING OR COOLING

Leslie E. Huntley, Rt. 1, P.O. Box 7, Reubens, Idaho 83548

Filed Feb. 11, 1974, Ser. No. 441,406

Int. Cl. F25b *9/00*

U.S. Cl. 62—88 **12 Claims**



1. A method for transferring heat between a first environment and a second environment, comprising: substantially adiabatically compressing gaseous working medium from the first environment by means of a positive displacement compressor, conducting the compressed and, accordingly, heated gaseous working medium from the compressor through a pressure passage of a heat exchanger to a positive displacement expander, conducting exhaust gaseous working medium from the second environment through a second passage of the heat exchanger to the first environment, transferring heat from the heated, compressed gaseous working medium to the exhaust gaseous working medium, adiabatically expanding the compressed gaseous working medium from which heat has been transferred through the positive displacement expander and into the second environment to extract work from and cool the expanded gaseous working medium, applying the work obtained from the expansion of the compressed gaseous working medium from the expander to the compressor, and varying the ratio of the effective swept volume per unit time of the compressor relative to the effective swept volume per unit time of the expander directly as the absolute temperature of the first environment varies, whereby cool gaseous working medium is provided from the expander to the second environment, heated exhaust gaseous working medium is supplied from the heat exchanger to the first environment and energy is conserved by the application of work from the expander to the compressor and by the substantially adiabatic compression and expansion of the compressed gaseous working medium.

3,896,633

COMBINATION AIR DRYING AND CLEANING APPARATUS

Cleo J. Moore, 3338 N.W. 17, Oklahoma City, Okla. 73107

Filed Oct. 15, 1974, Ser. No. 514,701

Int. Cl.^{2} F25D *21/00*

U.S. Cl. 62—272 **4 Claims**

1. An apparatus for dehumidifying compressed air, comprising:

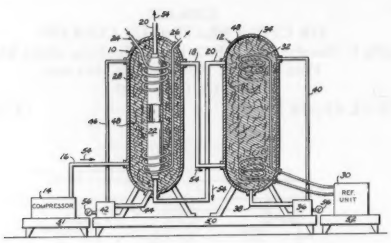
a source of compressed air;

a first elongated container forming a precooling chamber and air passageway for the flow of compressed air;

first heat exchange means including a coil extending through said container and circulating a fluid of known temperature within said first container;

a second elongated container forming a continuation of the air passageway;

second heat exchange means including a closed refrigerating unit having a refrigerant containing coil disposed within said second container; and,



piping means forming a part of the air passageway and connecting said containers with each other and with the source of compressor air,

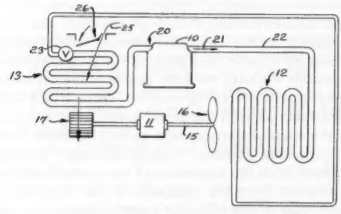
the downstream end portion of said piping means extending coaxially through said first container.

3,896,634

AIR CONDITIONING SYSTEM

Immanuel P. Nagele, Valley Center; Jerald W. Blakely, and Lloyd B. Vandeventer, both of Wichita, all of Kans., assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Feb. 19, 1974, Ser. No. 443,491
Int. Cl.[2] F25D *17/04*
U.S. Cl. 62—408 **5 Claims**



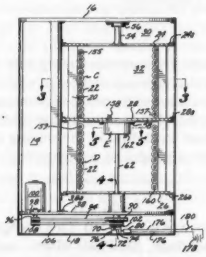
1. In an air conditioning system including a compressor for compressing a refrigerant, a condenser receiving refrigerant from the compressor and an evaporator receiving liquid refrigerant from the condenser and feeding gaseous refrigerant back to the compressor, the combination comprising: a fan motor provided with a shaft; a first condenser fan mounted to said shaft for forcing outside air over said condenser; a second evaporator fan mounted to said shaft for forcing room air over said evaporator through a room air conduit; and settable damper assembly means, a plate; and mounting means for said plate for selectively positioning said plate relative to said room air conduit between a fully closed position and an open position, said control means comprising mechanical link means including a flexible link connected at one end of said damper plate; a jacket slidably receiving said flexible link; first clamp means for anchoring said jacket adjacent said damper plate; a control switch for operating said fan motor and said compressor motor; second clamp means for fastening said jacket adjacent said switch, said second clamp means including a ramp for directing said link such that the axis thereof intersects with the rotatable shaft of said switch; has been inserted, the other end of said link being connected to said control switch and movable therewith in response to the turning on of said fan motor and said compressor motor, said link being actuatable to position said damper plate in the fully closed position to seal against the passage of room air through said room air conduit when said system is turned off and to move said plate through a continuous range of open positions in the "FAN ONLY" state between said closed position and said fully open position, said control switch being further actuatable to energize the compressor when said damper plate is in the fully open position with fan motor energized and being further actuatable to move said damper plate through a continuous range of positions to a relatively closed position while maintaining said compressor and said fan motor energized; whereby as said plate is moved between said relatively open position and said relatively closed position while said compressor is operating, the flow of air through said room air conduit is reduced, and the load on said fan motor is diminished, thereby increasing the speed of said fan motor and providing a greater flow of outside air to said condenser.

3,896,635

HEAT TRANSFER DEVICE AND METHOD OF USING THE SAME

Robert C. Stewart, 121 Twelfth St., Apt. C, Seal Beach, Calif. 90740

Filed Feb. 28, 1973, Ser. No. 336,510
Int. Cl.[2] F25B *3/00*
U.S. Cl. 62—499 **2 Claims**



1. An apparatus for concurrently forming a mass of air into a first cooled stream and a second heated stream thereof that includes:

a. an elongated housing that includes a top, bottom and continuous side wall extending therebetween, said housing having first, second, third and fourth longitudinally spaced openings therein;

b. a rotatable assembly disposed in said housing, said assembly including a first upper circular plate, a second lower circular plate, a third circular plate intermediately positioned between said first and second plates, a plurality of elongate, circumferentially spaced, rigid members connected to the peripheries of said first, second and third plates; a tubular evaporator coil supported from said members above said third plate; a tubular condenser coil supported from said members below said third plate; a compressor that includes a housing having an inlet and an outlet, a rotor, and shaft for driving said rotor, said housing secured to said third plate; said evaporator coil having first and fourth ends and said condenser coil second and third ends, said first end connected to said inlet, said second end connected to said outlet; a length of tubing within said evaporator and condenser coils that connects said third and fourth ends; an expansion valve in said length of tubing; and a quantity of refrigerant in said evaporator and condenser coils that liquifies when subjected to a predetermined pressure;

c. first means for rotatably supporting said assembly in a fixed position in said housing; said top, first plate and a portion of said housing defining a first confined space in communication with said first opening; said first plate,

third plate, and said evaporator coil defining a second confined space, with said first and second confined spaces at all times being in communication by at least one first port formed in said first plate; said second plate and the portion of said housing therebelow defining a third confined space in communication with said fourth opening; said second and third plates and said evaporator coil defining a fourth confined space that is in communication with said third confined space due to at least one second port formed in said second plate; said second and fourth confined spaces at all times in communication with said second and third openings;

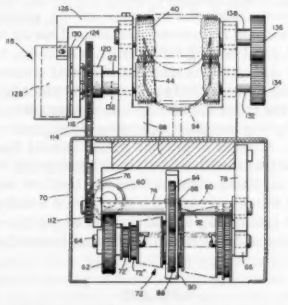
d. first, second and third sealing means that extend inwardly from said housing and slidably engage said first, second and third plates as said assembly rotates;

e. power means for concurrently rotating said assembly and said shaft of said compressor at different rates of rotation, with said refrigerant being subjected to said predetermined pressure by said compressor as said refrigerant discharges into said condenser coil to liquify therein and to subsequently expand back to the gaseous state as it flows through said expansion valve back to said evaporator coil to absorb heat as it expands in said evaporator coi; and air in said second and third confined spaces being concurrently discharged therefrom through openings in said evaporator and condenser coils due to the centrifugal action imposed on said air as said assembly rotates, said air so discharged constituting said first and second streams that flows outwardly from said housing through said second and third openings therein, said first and second streams prior to flowing from said second and third openings being cooled and heated respectively due to heat exchange contact with said evaporator and condenser coils, and said air as it discharges from said second and third confined spaces being replaced by air that flows thereinto from said mass of air through said first openings and said first port and said fourth opening and second port respectively.

3,896,636
SLIVER FEEDING MEANS FOR HIGH PILE FABRIC CIRCULAR KNITTING MACHINES

Thomas J. Thore, Tarboro, N.C., assignor to Glenoit Mills, Inc., New York, N.Y.

Filed Nov. 6, 1972, Ser. No. 304,099
Int. Cl.[2] D04B 9/14
U.S. Cl. 66—9 B 9 Claims



1. In a sliver high pile fabric knitting machine having a circle of needles and a plurality of sliver feeding devices for feeding sliver fibers to the needles, each said sliver feeding device including a doffer, a pair of rotatable sliver feed rolls and drive means for the feed rolls, a plurality of pattern means for controlling individually the rotation of the feed rolls of each sliver feeding device, each such pattern means being operatively associated with one only of the sliver feeding devices, each said pattern means including:

a. an electric clutch engageable selectively with the sliver feed rolls of the sliver feeding device,

b. a first control means for controlling the clutch, to impart intermittent rotation selectively to the feed rolls, said first control means including,

i. a needle selecting drum disposed adjacent the circle of needles and having a complement of jacks,

ii. a microswitch mounted adjacent the drum and controlled by the jacks, and connected electrically to the clutch of the sliver feeding device,

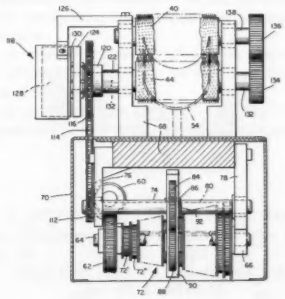
iii. needle selecting means disposed between the drum and the needles, for selecting needles at another sliver feeding device,

c. and a second control means to vary selectively the rate of rotation of the feed rolls, when the clutch is engaged therewith, to vary selectively the rate of delivery of sliver fibers to the needles.

3,896,637
SLIVER FEEDING MEANS FOR HIGH PILE FABRIC CIRCULAR KNITTING MACHINES

Thomas J. Thore, Tarboro, N.C., assignor to Glenoit Mills, Inc., New York, N.Y.

Division of Ser. No. 304,099, Nov. 6, 1972. This application Apr. 18, 1974, Ser. No. 461,908
Int. Cl.[2] D04B 9/14
U.S. Cl. 66—9 B 11 Claims



6. In a sliver feeding means for a high pile fabric circular knitting machine having a rotatable needle cylinder with a complement of needles and a rotatable ring gear, said sliver feeding means including a doffer, a main cylinder, a single pair of sliver feed rolls and drive means for driving the doffer and cylinder from the ring gear at selected constant speeds of rotation, the improvement comprising

a. a separate drive system for the sliver feed rolls, said separate drive system being driven from the ring gear and including

b. fabric density control means interposed between the ring gear and the feed rolls to vary selectively the rate of rotation of the feed rolls, to vary selectively from a sliver roving the rate of delivery of sliver fibers to the needles, said fabric density control means including

i. a group of individual gears of varying size,

ii. drive means connecting the group of gears to the feed rolls, to drive the feed rolls rotatably,

iii. said drive means including a gear selector engageable selectively with one gear of the group of gears for imparting a selected speed of rotation to the feed rolls.

11. Sliver feeding means for a high pile fabric knitting machine having a circle of needles, said sliver feeding means including a pair of rotatable sliver feed rolls and rotatable means for transferring sliver fibers from the

feed rolls to the needles, the combination comprising:
a. sliver shredding means including,
i. a wire covering for each feed roll, each said wire covering including a plurality of circumferentially extending wires, and
ii. a wire covering for the sliver transfer means comprising a plurality of circumferentially extending wires,
iii. each of said wire coverings intermeshing with each of the other wire coverings,
b. drive means for rotating the feed rolls and
c. pattern means for controlling selectively the rotation of the feed rolls comprising
i. a first control means operative to impart rotation to the feed rolls to deliver sliver selectively to the transfer means according to a predetermined pattern and
ii. a second control means to vary selectively the rate of rotational speed of the feed rolls, to vary selectively the rate of delivery of sliver fibers to the transfer means.

3,896,638

PROGRAMME CONTROL DEVICES

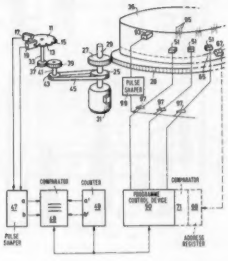
Gernot Gottschall, Boblingen, and Peter Doslik, Bonlanden, both of Germany, assignors to Firma Franz Morat GmbH, Stuttgart, Germany

Filed June 7, 1972, Ser. No. 260,413

Claims priority, application Germany, June 16, 1971, 2129851

Int. Cl. D04b *15/78*

U.S. Cl. 66—50 R **19 Claims**



1. A programme control device for the working parts of a periodically operated machine, said machine having machine operation sequences, each sequence having the same number of machine strokes, comprising in combination: a storage means for storing information for controlling the working parts; reading means for reading out and feeding information words from said storage device to the working parts; reading clock means for producing reading clock signals, said reading clock signals being fed to said reading means such that new information words are only fed to said working parts after feeding a reading clock signal to said reading means; means for generating for each machine stroke of said machine operation sequences a different code signal; and means for deriving different expected code signals from said code signals, said expected code signals having the same code as said code signals but being generated in an order prescribed by the function of said machine; said reading clock means including means for comparing each generated code signal with each generated expected code signal so that a reading clock signal and a new expected code signal are only generated when said code signal corresponds to an expected code signal.

3,896,639

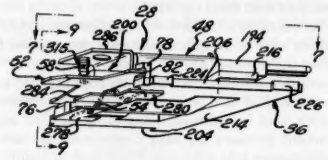
KNITTING MACHINE ACTUATORS

Paul Christiansen, Novelty; Walter A. Hofmann, Lyndhurst, both of Ohio, and Werner Muller, Farmington, Conn., assignors to Hayes-Albion Corporation, Norristown, Pa.

Filed Jan. 9, 1973, Ser. No. 322,132

Int. Cl. D04b *15/78*

U.S. Cl. 66—50 R **40 Claims**



1. A knitting machine comprising needle carrier means for moving a plurality of knitting needles through a knitting station, a plurality of jack means each of which is associated with one of said needles and is operable between knit and nonknit conditions, and a plurality of actuator means disposed at the knitting station for effecting operation of said jack means between the knit and nonknit conditions, each of said actuator means including coil means energizable to provide a magnetic field, a frame member having a plurality of parallel interconnected leg sections including a first leg section extending through said coil means, a second leg section disposed on one side of said first leg section, and a third leg section disposed on a side of said first leg section opposite said one side, an armature member movable under the influence of a magnetic field emanating from said coil means, and mounting means connected with said second and third leg sections for supporting said armature member for pivotal movement between a first position in which said armature member is ineffective to operate one of said jack means between the knit and nonknit conditions and a second position in which said armature member is effective to operate one of said jack means between the knit and nonknit conditions, the magnetic field emanating from said coil means of each of said actuator means being effective upon energization thereof to attract said armature member with a magnetic force which increases at an increasing rate as said armature member moves between the first and second positions, each of said actuator means further including first spring means for providing a first biasing force opposing movement of said armature member between the first and second positions under the influence of the magnetic field emanating from said coil means, and second spring means for providing a second biasing force which is effective to oppose movement of said armature member after said armature member has moved part way between said first and second positions against the influence of said first biasing force, said first and second spring means cooperating during movement of said armature member to provide a total biasing force which increases at a first rate during an initial portion of the movement of said armature member between the first and second positions and which increases at a second rate which is greater than the first rate during a final portion of the movement of said armature member between the first and second positions.

3,896,640

DEVICE FOR THE DETECTION OF EXCESSIVE THREAD TENSION AND THREAD BREAKAGE

Jacques Palencher, Troyes, France, assignor to Lebocey Industrie, Troyes, France

Filed Apr. 9, 1973, Ser. No. 349,014

Int. Cl. D04b *35/12, 35/14*

U.S. Cl. 66—161 **2 Claims**

1. A device for detecting the breakage of, and excessive

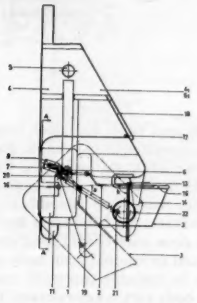
tension in, the thread operating in a knitting machine comprising:

a. a case;

b. a first detection lever pivotally mounted to said case, said first detection lever being arranged and configured to detect the breakage of said thread;

c. a second detection lever pivotally mounted to said case, said second detection lever being arranged and configured to slidably support said thread; and

d. a spring means having first and second ends, said first end thereof being connected to said case at a first point and said second end thereof being connected to said second detection lever at a second point thereon, the return force of said spring tending to maintain said second detection lever against an abutment, said first and second points being situated on opposite sides of an imaginary straight



line joining the axis of rotation of said second detection lever and the point at which said thread engages said second detection lever, said first point being situated nearer to the axis of rotation of said second detection lever than to said point at which said thread engages said second detection lever, and said second point being situated nearer to said point at which said thread engages said second detection lever than to the axis of rotation of said second lever, the length of said spring being approximately equal to the distance between the axis of rotation of said second detection lever and said point at which said thread engages said second detection lever,

whereby, said second detection lever is responsive to excessive tension in said thread by pivoting about its axis of rotation and against the return force of said spring until said thread escapes thereform.

3,896,641

COMBINATION LINT FILTER AND ADDITIVE DISPENSER FOR AUTOMATIC WASHER

Joseph C. Worst, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed July 30, 1973, Ser. No. 384,014
Int. Cl.[2] D06F *39/02, 39/10*
U.S. Cl. 68—17 R **5 Claims**

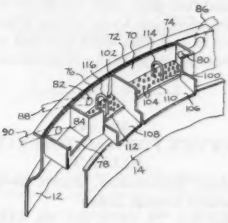
1. In a washing machine having a container for receiving items to be washed and means for recirculating liquid therein, a combination filter, additive-dispenser comprising:

a receptacle having at least one chamber and arranged for receiving an additive to be introduced into said container;

liquid diversion means including a conduit communicating the receptacle with said recirculation means and operable at predetermined times for causing at least a portion of the recirculating liquid to flow into the receptacle for effecting transfer of the additive into said container;

filtration means arranged in the receptacle for removing foreign material from the flow of recirculating liquid before said liquid re-enters said container, said filtration means comprising a plurality of generally parallel, spaced-apart pins projecting from a substrate arranged such that incoming recirculating liquid flows thereover; and

mechanical means for manually cleaning the filtration means comprising a rigid plate having a plurality of holes therein at least corresponding to the pins of the filtration means, the plate normally superimposed over said pins so as to be in close proximity to said substrate such that the incoming liquid flows over the plate, and means for manually gripping the plate, whereby it is removed from its normal position, foreign material removed by the pins



from the flow of recirculating liquid will be stripped from the pins.

3. The invention of claim **2** wherein said lint filter-additive dispenser is adapted for mounting in said washing machine so as to be secured to said container at the top portion thereof, and further comprising cover means for gaining access into said receptacle.

4. The invention of claim **3** wherein access to said cover means is through an aperture in said appearance cabinet adjacent said access cover.

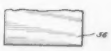
5. The invention of claim **4** wherein said receptacle includes three chambers, two of which are provided with lint filter means.

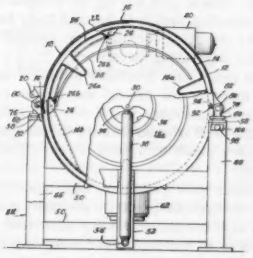
3,896,642

COMMERCIAL LAUNDRY MACHINE

Alex Toth, Lincolnwood, Ill., assignor to Ellis Corporation, Chicago, Ill.

Filed Dec. 13, 1973, Ser. No. 426,952
Int. Cl. D06f *39/00*
U.S. Cl. 68—210 **12 Claims**





1. A commercial laundry machine comprising a support base, a cylindrical casing supported from said base with its longitudinal axis extended horizontally, said casing having a

wall with an opening therein for loading and unloading of laundry material into and out of said casing, first detachable connector means on one side of said longitudinal axis for releasably supporting said casing and permitting pivotal movement about a first horizontal pivot axis on said base in one direction relative to said base, second detachable connector means on an opposite side of said longitudinal axis for releasably supporting said casing and permitting pivotal movement about a second parallel pivot axis on said base in an opposite direction, and means interconnecting said base and said casing at at least one point spaced from said first and second axes for pivoting said casing in said one direction to an elevated eccentric unloading position relative to said base when said second connector means is detached wherein said opening is spaced outwardly of said first pivot axis and for pivoting said casing in said opposite direction to an elevated eccentric loading position relative to said base when said first connector means is detached wherein said opening is between said pivot axes.

3,896,643

LOCKING DEVICE FOR A MOTORCYCLE DRIVER'S HELMET

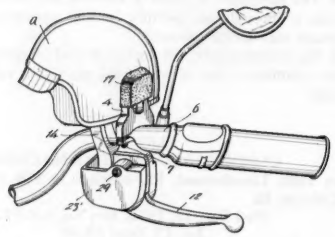
Hideo Kawakami, Hamamatsu, Japan, assignor to Takagi Tekko Kabushiki Kaisha, Japan

Filed Nov. 23, 1973, Ser. No. 418,759

Claims priority, application Japan, Nov. 26, 1972, 47-135713

Int. Cl. E05b *69/00*

U.S. Cl. 70—59 **4 Claims**



1. An apparatus

for selectively securing and releasing a helmet to the handle bar of a vehicle, comprising, in combination:

a body structure adapted to be mounted on said handle bar of said vehicle and having an integral stationary pinch arm extending uprightly on said body structure;

said body structure including an integral mounting plate member depending therefrom;

a pivotal pinch arm pivotably mounted on said mounting plate member for pivotal movement toward and away from said stationary pinch arm for selectively pinching the rear wall of said helmet in co-operation with said stationary pinch arm, and for selectively releasing said helmet;

an operation lever pivoted to said mounting plate member and to said pivotal pinch for pivotably moving said pivotal pinch arm toward and away from said stationary pinch arm so as to increase and reduce the distance between said stationary and pivotal pinch arms; and

a locking mechanism mounted on said mounting plate member for locking said operation lever when said helmet is pinched between said stationary and pivotal pinch arms.

3,896,644

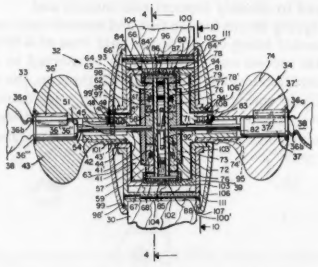
DOUBLE SPIN KNOB DOOR LOCK

Charles E. Nagy, 3221 Benda Pl., Hollywood, Calif. 90068, and John F. Nagy, 785 W. End Ave., New York, N.Y. 10025

Filed Oct. 11, 1974, Ser. No. 514,119

Int. Cl.² E05B *55/06, 3/04*

U.S. Cl. 70—149 **11 Claims**



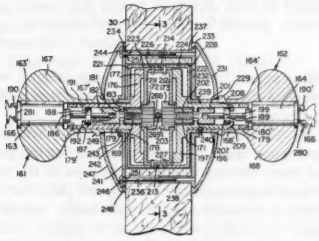
1. A double spin knob door lock comprising two axially-opposing key-operated hand knob assemblies, assembled casing parts enclosing portion of the hand knob assemblies and adapted to fit within a cutout lock opening in a door, as a unit one of the hand knob assemblies extending from inside of the door and the other hand knob assembly extending from outside of the door, each of said hand knob assemblies having a hand knob and an internal main body part connected to the hand knob to be turnable therewith, radially adjustable key bar means on body part, a key-operated tumbler lock cylinder extending axially through the hand knob and a square operating shaft extending inwardly therefrom and through the main body part and freely turnable therein, a turnable cam-track supporting member connected to the shaft to be driven thereby and having cam-track thereon, said cam-track supporting member turnable relative of the main body part independently thereof to positively radially-adjust the key bar means on the body part, said cam track supporting means having a square opening with which said tumbler lock square operating shaft drivingly engages to turn the turnable cam-track supporting means and the said cam-track operable upon the radially-adjustable key bar means to positively thrust the key bar means radially-outwardly or positively-inwardly as a door key is inserted into the key-operated tumbler lock cylinder and the square shaft turned thereby, an internally-serrated ring lying inwardly of the main body part with serrations with which the key bar means will have drive engagement when the key bar on cam-track supporting means is radially-outwardly adjusted by the turning of the tumbler lock cylinder, a drive plate disposed inwardly of and lying adjacent to the serrated ring, a spacing ring disposed between the drive plates of the two opposing assemblies to provide space therebetween, means for securing together the spacing ring, the serrated rings and the drive plates of the associated hand knob assemblies to provide a common lock bolt operating mechanism, means for mounting the common lock bolt operating mechanism in axial relationship with and between the hand knob assemblies and in said casing parts for rotation with respect thereto, a lock bolt assembly extending laterally from the common lock bolt operating mechanism, and adapted to extend through the side edge of the door for engagement with a door frame keeper plate in the door frame opening, said lateral lock bolt assembly having a vertically-extending slot, a work pin extending between the drive plates of the common lock bolt operating mechanism and through the vertically-extending slot of the lock bolt assembly to retract and extend the same and means for securing the assembled casing enclosing parts and the hand knob assemblies upon the door whereby the door will be locked from both sides thereof by virtue of the key bar means of the hand knob assemblies being

retracted radially-inwardly out of engagement from their serrated rings of the common lock bolt operating mechanism and the hand knobs of both inside and outside knob assemblies left free to spin upon the door.

3,896,645
DOUBLE SPIN KNOB DOOR LOCK

Charles E. Nagy, 3221 Benda Pl., Hollywood, Calif. 90068, and John F. Nagy, 785 West End Ave., New York, N.Y. 10025

Filed Oct. 11, 1974, Ser. No. 514,120
Int. Cl.[2] E05B *55/06, 3/04*
U.S. Cl. 70—149 **10 Claims**

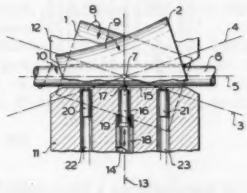


1. A double spin hand knob door lock comprising two axially-opposing hand knob assemblies, a casing assembly for joining the hand knob assemblies together and adapted to be inserted therewith as a unit into a cutout lock opening in the door adjacent the edge thereof, said casing having and opening adjacent the door edge, one of said hand knob assemblies extending from the inner side of the door and the other hand knob assembly extending from the outer side of the door, each of said hand knob assemblies including a body part journaled in the casing assembly and a hand knob extending outwardly from the body part to turn the same, a tumbler lock cylinder fixed within the hand knob and having a drive shaft extending inwardly therefrom, an operating block journaled in the body part and having a fast-threaded projection thereon, an externally-splined nut journaled in the body part and threadedly connected to the fast threaded block projection to be positively thrust inwardly when the lock cylinder and its shaft are turned by the key, an internally-splined ring journaled in the casing assembly and receiving the externally-splined nut when thrust thereinto by the turning of the fast threaded block, a lock bolt assembly laterally-adjustable through the opening in the casing assembly and the door edge between retracted and extended lock positions with respect to the door edge, a crank pin extending between the internally-splined rings of the both assemblies and operatively connected to the lock bolt assembly to positively retract and extend the same, and means for securing the casing assembly in the cutout lock opening of the door, the hand knob of each of the hand knob assmblies, upon the externally-splined fast thread nut being retracted from its cooperating ring by the lock cylinder and its shaft, being free to spin thereby effectively locking the door from the inner and outer sides thereof, the inner side as well as the outer side.

3,896,646
TESTING PROBE FOR NON-DESTRUCTIVE TESTING OF MATERIAL

Hans M. Lange, Reutlingen, Germany, assignor to Institut Dr. Friedrich Forster, Reutlingen and Th. Kieserling & Albrecht, Solingen, both of, Germany

Filed Feb. 20, 1974, Ser. No. 444,047
Claims priority, application Germany, Feb. 21, 1973, 2308446
Int. Cl. B21b *19/10*
U.S. Cl. 72—14 **4 Claims**



1. In a material straightening machine having a pair of rolls for forming the material and moving it along a definite path: a guide rail located at one side of the material as it moves along the path;

first and second material position sensors carried by said guide rail and spaced from one another along the path, said sensors each providing respective electric signals when the material is located immediately opposite thereto;

circuit means responsive to the lack of one or both electric signals from said first and second material position sensors for providing a further electric signal;

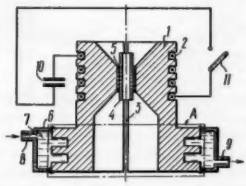
a material defect detecting probe carried by said guide rail between said first and second sensors; and

means responsive to the circuit means further signal for moving said probe in a direction away from the material.

3,896,647
INDUCTOR FOR SHAPING PARTS BY PULSED MAGNETIC FIELD PRESSURE

Valery Mikhailovich Mikhailov, Komsomolsky prospekt 10, kv. 150, and Lev Timofeevich Khimenko, poselok Pokatilovka, ulitsa Ulyanovskaya, 35, both of Kharkov, U.S.S.R.

Filed Mar. 19, 1973, Ser. No. 342,799
Int. Cl. B21d *26/14*
U.S. Cl. 72—56 **2 Claims**

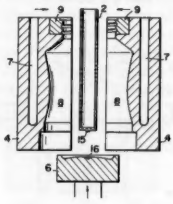


1. An inductor for shaping parts by pulsed magnetic field pressure comprising: a concentrator having an axial opening extending throughout its length, a portion of said opening serving to receive a part to be shaped therein; a winding for inducing current in said concentrator and disposed on a portion of the outer side surface of said concentrator around said part of the axial opening with said part to be shaped placed therein, the other portion of said outer side surface of said concentrator extending in a radial direction, in the form of fins to ensure cooling of the concentrator through contact with cooling means.

3,896,648
BLOW MOLDING PROCESS FOR CONTAINER OF SUPERPLASTIC ALLOY

Francis Schertenleib, Furstentum, Liechtenstein, assignor to Alter Licensing Establishment, Vaduz, Liechtenstein

Filed May 31, 1974, Ser. No. 474,964
Claims priority, application Japan, Oct. 2, 1973, 48-110915
Int. Cl. B21d *26/04*
U.S. Cl. 72—61 6 Claims



1. A method of manufacturing a blow-molded article of a container made of a superplastic alloy, comprising the steps of:

a. forming a bottomed cylinder from a starting material of said superplastic alloy,

b. performing a mechanical finish processing for smoothing the surfaces of said cylinder and for enhancing the dimensional accuracy,

c. preheating the finish-processed cylinder by holding it in a temperature range of 200° to 300°C for at least two minutes,

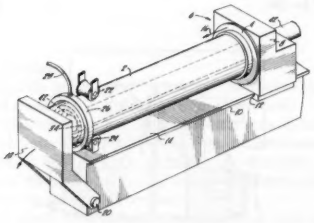
d. receiving the heated cylinder in a metal mold assembly, and blowing out said cylinder from the port side towards the interior thereof by fluid pressures of an initial pressure of at least 8 atm. and a molding pressure in the range of 7 – 20 atm., and

e. cooling said metal mold assembly by air blast before it is opened to take out the inflated product therefrom.

3,896,649
METHOD AND APPARATUS FOR BENDING PIPE

James M. Stuart, Costa Mesa, Calif., assignor to Rollmet, Inc., Santa Ana, Calif.

Filed Mar. 4, 1974, Ser. No. 447,886
Int. Cl. B21d *7/16*
U.S. Cl. 72—128 13 Claims



1. A device for bending pipe comprising:

a first burner means through which the pipe is passed to heat a narrow band of the exterior of the pipe to a temperature substantially reducing its yield point;

second burner means around which the tube is passed to heat a narrow band of the interior of the tube to a temperature substantially reducing its yield point, said interior heated band and said exterior heated band being substantially opposite each other;

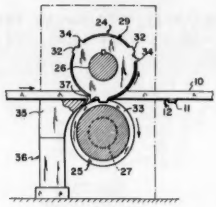
means for feeding the pipe past said burners; and

means for applying a bending moment to the heated portion of the pipe.

3,896,650
STEEL BUILDING COMPONENTS WITH ATTACHMENT MEANS FOR WALL AND FLOOR SURFACE ELEMENTS AND MANUFACTURE THEREOF

Theodore S. O'Konski, Wheeling, W. Va., assignor to Wheeling-Pittsburgh Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 168,967, Aug. 4, 1971, Pat. No. 3,802,147.
This application Sept. 27, 1973, Ser. No. 401,270
Int. Cl. B21d *13/04*
U.S. Cl. 72—186 3 Claims



1. Rolling apparatus by which to form integral wall attachment means in steel studding of the hollow thin wall type, said apparatus comprising:

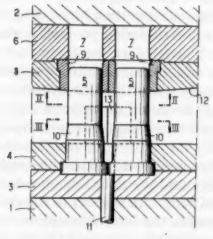
a. a pair of oppositely rotating rolls supported in parallel relation and spaced so as to accomodate the gauge of the steel sheet moving therebetween, one of the rolls having a circumferential groove therein and the other roll having therein a plurality of pairs of closely spaced teeth arranged circumferentially so as to register with the said groove in the said one roll, and

b. an anvil stationarily supported in advance of said rolls and having an open-end slot for receiving the trailing tooth of each of said pairs while the leading tooth of the same pair is within the said groove.

3,896,651
METHOD OF FORGING COMPONENTS HAVING RADIALLY PROJECTING ARMS, E.G. CRUCIFORM COMPONENTS, AND TO PRESS APPARATUS FOR USE IN CARRYING OUT THE METHOD

Hery Starkier, 21, Rue des Petits Champs, Paris, France (75001)

Filed Dec. 28, 1973, Ser. No. 429,137
Claims priority, application France, Jan. 16, 1973, 73.01456
Int. Cl. B21c *25/08*
U.S. Cl. 72—260 5 Claims



1. A method of forging parts having radially projecting arms, which method comprises squeezing between two substantially planar surfaces, a metal billet disposed within an arrangement of parallel substantially cylindrical columns which are disposed closely about the billet with their lengthwise axes extending parallel to the direction of the relative

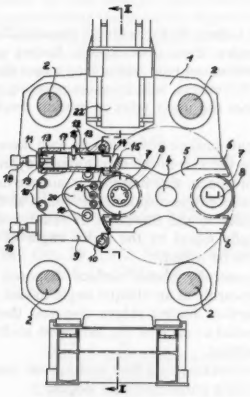
movement of the planar surfaces in squeezing a billet, the number of columns corresponding to the number of arms to be provided on the part.

2. Press apparatus comprising two parallel platens each of which carries a die plate and one of which is movable to move the die plates towards and away from each other, and at least three substantially cylindrical columns secured by one end thereof to one of said platens and arranged with their respective lengthwise axes parallel to each other, which columns are disposed about a central region for containing a workpiece and having their lengthwise axes disposed parallel to the direction of relative movement of the platens, the portions of the columns adjacent said central region for containing a workpiece are tapered in a direction towards said other ends, the other of the platens and its die plate having apertures therein through which the other ends of the columns are slidable.

3,896,652
LOCKING SYSTEM FOR A ROTARY DIE CARRIER OF AN EXTRUSION

Horst Hans Groos, and Urban Richardt, both of Metzkausen, Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 11, 1974, Ser. No. 505,025
Int. Cl. B21c *21/00*
U.S. Cl. 72—263 **10 Claims**



1. In an extrusion press comprising a front platen, a cylinder platen, tie means connecting said front platen to said cylinder platen, a billet container for receiving material to be extruded, means mounting said billet container for movement along a press axis, power means for retracting said billet container, a rotary die carrier mounting a die on said press axis, means mounting said rotary die carrier for rotation about an axis spaced from but parallel to said press axis, extrusion ram means for extruding said material through said die along said press axis to form an extrusion and a billet discard left behind said die, and a cropping device for cropping off said billet discard between said billet container and said die,

a die carrier locking system comprising:

two separate locking members defining engagement surfaces for engaging said die carrier to prevent both axial movement of said die carrier during billet discard tear-out or tear-off and rotary movement of said die carrier during billet discard shearing;

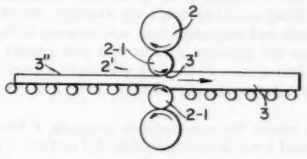
mounting means mounting said locking members for sliding movement in a direction perpendicular to the direction of said press axis, said mounting means being fixed to said front platen and each said locking member having a substantial length thereof which is substantially surrounded on all sides by said mounting means; and

means for actuating said locking members to engage said die carrier.

3,896,653
METHOD FOR PRODUCING DIFFERENTIAL THICKNESS STEEL PLATE

Kazuo Sakai; Ken Iwanaga; Kazuo Maehara; Tsuyoshi Nakajima, all of Kisarazu; Koki Yotsuya; Humio Ookuma, both of Kimitsu; Takeo Baba, and Toshitaka Yamanaka, both of Himeji, all of Japan, assignors to Nippon Steel Corporation, Japan

Filed Sept. 14, 1972, Ser. No. 289,167
Claims priority, application Japan, Sept. 18, 1971, 46-72886; Sept. 18, 1971, 46-72887; Dec. 3, 1971, 46-97161; June 5, 1972, 47-55868; Sept. 18, 1971, 46-85299
Int. Cl. B21b *1/00*
U.S. Cl. 72—365 **6 Claims**

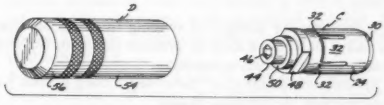


1. A method for producing a differential thickness steel plate having a step portion at least on one side by hot rolling a steel material through a rolling mill comprising adjusting the rollers of the rolling mill to a preset roll gap, conveying the steel material to the rolling mill, rolling the steel material commencing with an end thereof in the rolling mill, reversing the direction of rolling of the steel material after a specific portion thereof has been rolled, and finishing said rolling with a temperature range of 680° to 1050°C whereby a differential thickness steel plate is formed.

3,896,654
DIESEL INJECTOR TUBE BODY REFORMING TOOL

Timothy R. Mancini, 17319 Horst Ave., Cerritos, Calif. 90701

Filed Apr. 12, 1974, Ser. No. 460,371
Int. Cl.² B21D *41/02*
U.S. Cl. 72—393 **5 Claims**



1. A lightweight portable tool for reforming a ring-shaped flange on a copper injection tube body in a diesel engine head to permit said flange to pressure contact a resilient O-ring and seal therewith without removing said head from said engine, which injection tube body is of a type that includes upper and lower tubular sections of different internal diameter, which at their junction define a circumferentially extending body shoulder that tapers downwardly and inwardly, with said upper section having a machine finished interior cylindrical surface, said upper section having said flange extending outwardly from the upper end thereof, which tool includes:

a. a plug of substantially lesser depth than the length of said first section, saiid plug having a transverse cross section such that said plug is snugly and slidably insertable within the interior of said upper section, with said plug having a tapered ring-shaped lower end that is adapted to said body shoulder, which plug includes a plurality of circumferentially spaced fingers that extend upwardly therefrom

to the top of said first section when said injection tube body is disposed in said head with said flange extending over said O-ring that is disposed in a circular recess formed in an upper surface of said head, said plug having a first, centered, longitudinally extending and internally threaded bore therein below said fingers, with said fingers including arcuately curving external surfaces that have substantially the same radius of curvature as said interior surface of said first section, and said fingers having internal surfaces that taper downwardly and inwardly towards one another;

b. a rigid, elongate body that has a longitudinal second bore formed therein of greater transverse cross section than that of said first bore, said body having an external frusto-conical surface that tapers downwardly and inwardly at substantially the same angle as said interior surfaces of said fingers;

c. a threaded rod that extends downwardly through said second bore and engages said threads in said first bore;

d. a head on said rod for rotating said rod, which head when said rod is rotated in an appropriate direction with said plug being seated on said body shoulder, moves said body towards said plug and forces said external surfaces of said fingers into pressure contact with said interior surface of said first section to prevent said section from deforming when a longitudinally directed force is applied thereto; and

e. first means for concurrently applying a longitudinally directed force to the entire external surface of said flange in a direction towards said head to reform said flange to sealingly pressure contact said O-ring and without deforming said first section.

3,896,655

APPARATUS FOR SIZING AND SHAPING ENDS OF PIPES

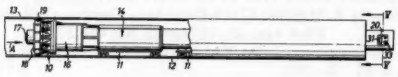
Geoffrey Walter Watson, Inverness, Scotland, assignor to A. I. Welders Limited, Inverness, Scotland

Filed July 23, 1973, Ser. No. 381,521

Claims priority, application United Kingdom, July 25, 1972, 35180/72

Int. Cl. B21d *41/02*

U.S. Cl. 72—393 **2 Claims**



1. Apparatus for sizing and shaping the adjacent ends of large heavy duty pipes so as to prepare said ends for welding coaxially to each other, comprising:

a circumferential array of movable forming blocks; means supporting the forming blocks;

guide means serving to guide movement of each forming block along a respective substantially radial path; and

a power plant which includes a piston and cylinder device having a movable piston rod which projects through and is guided for rectilinear movement through an end wall of the cylinder for moving each of the blocks along its respective path and a fluid pressure pump for generating fluid pressure to operate said piston and cylinder device, said fluid pressure pump having a fluid pressure output which is connected to a cylinder space of the piston and cylinder device;

said supporting and guide means being secured detachably to said power plant and including:

an annular support block which is secured detachably to the piston rod outside the cylinder; and

anchorage means secured detachably to the cylinder;

each forming block being connected to the anchorage means by a linkage and being arranged for sliding movement on a co-operating radially outer surface portion of the support block which is angled with respect to the axis of the piston rod so that rectilinear movement of the rod due to the action of fluid pressure in said piston and cylinder device results in sliding movement between each forming block and the co-operating angled surface portion of the support block so that the forming blocks are moved radially.

3,896,656

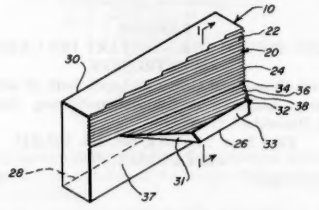
CONTOURED THREAD ROLLING DIES

Roger W. Orlomoski, Holden, Mass., assignor to Litton Industrial Products, Inc., Holden, Mass.

Filed Jan. 4, 1974, Ser. No. 430,800

Int. Cl.² B21D *17/00*

U.S. Cl. 72—469 **4 Claims**



1. A thread rolling die for rolling a threaded fastener having a tapered portion from a workpiece having a substantially cylindrical portion, said die comprising a face elongated in the direction of movement, said face cooperating with a similar face on another die upon relative motion therebetween and comprising:

a first planar surface disposed on said face substantially parallel to the axis of the substantially cylindrical portion of the workpiece, said first planar surface having substantially parallel ridges disposed thereon at an included angle with respect to the direction of relative die movement substantially equal to the helix angle of the threaded fastener to be rolled;

a second generally planar surface disposed on said face rising outwardly at an oblique angle to said first generally planar surface having ridges disposed thereon substantially parallel to each of the ridges on said first generally planar surface,

the line intersecting said first and second generally planar surface being parallel to said ridges.

3,896,657

VERTICAL IMPACT TESTER

Neill M. Brandt, Sturbridge; Richard D. Courtemanche, Southbridge, and Bruce D. Johnson, Sturbridge, all of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed May 7, 1973, Ser. No. 358,247

Int. Cl.² G01N *3/62, 3/30*

U.S. Cl. 73—12 **4 Claims**

1. Impact testing apparatus comprising:

a. base means arranged to be positioned level,

b. specimen support means for test specimens of frangible material or the like mounted on said base means,

c. upwardly directed frame means depending from said base means,

d. missile directing tubular barrel means mounted on said frame means positioned vertically above said specimen support means,

e. solenoid means mounted on said frame means above said tubular barrel means, including a magnetizable tubular core,

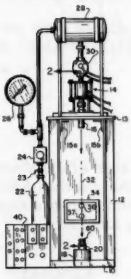
f. non-magnetic adjustable connector means between said tubular barrel means and said tubular core inclusive of a

missile supporting internal shoulder, for varying the position of said internal shoulder with respect to the end of said tubular core,

g. gas line means connected to said tubular core,

h. valve means for opening and closing said gas line means,

i. an enlarged gas chamber communicating with said valve means providing a volume of gas for propelling a missile held in said tubular barrel toward said specimen



support means at a velocity greater than that achieved by a gravity fall of a missile,

j. supply means for said enlarged gas chamber,

k. means for controlling the pressure of gas from said supply means to said enlarged gas chamber, and

l. means for determining the velocity of a missile propelled toward said specimen support at a predetermined height above said specimen support.

3,896,658

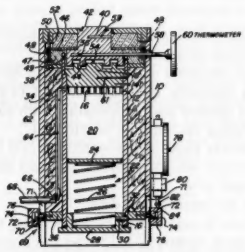
CONTROLLED LOW-TEMPERATURE COOLING APPARATUS

Mahn Hee Hahn, Washington, D.C., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Oct. 29, 1973, Ser. No. 410,680

Int. Cl. G01n *25/66*

U.S. Cl. 73—17 A **7 Claims**



1. A device for cooling an object comprising: wall means including side and at least one end wall means defining a housing;

said end wall means having an opening therein;

a first thermally conductive member located within said housing and including a portion extending through said opening for contacting an object to be cooled;

a second thermally conductive member located in said housing in adjustably spaced relation to said first member for creating a gap therebetween;

said first and second members having facing surfaces having mating grooves and projections for increasing the surface area of the gap across which thermal transfer can occur;

said mating grooves and projections extending axially of the axis of said housing;

means located within said housing for cooling said second member,

means for effecting relative axial movement between said first and second members for varying said gap;

and means for measuring the temperature of said first member.

3,896,659

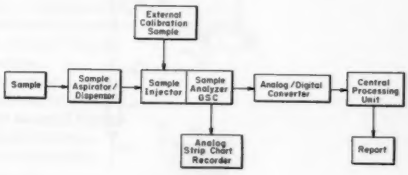
METHOD FOR DETERMINING THE ETHANOL CONTENT OF ALCOHOLIC BEVERAGES

Donald E. Goodman, Jacksonville, Fla., assignor to Bacardi and Company, Ltd., Vaduz, Liechtenstein

Continuation-in-part of Ser. No. 391,522, Aug. 27, 1973, abandoned. This application Oct. 4, 1973, Ser. No. 403,413

Int. Cl. G01n *31/08*

U.S. Cl. 73—23.1 **8 Claims**



1. A high-resolution method for determining the proof, P_x, of an alcoholic beverage containing water and ethanol, said method comprising the steps of:

a. forming a solution of a known volume of ethanol and a known volume of water and having a known proof, P_1, wherein the volumetric ratio of ethanol-to-water, R_1, is greater than the volumetric ratio of ethanol-to-water, R_x, in the beverage;

b. forming a solution of a known volume of ethanol and a known volume of water and having a known proof, P_2, wherein the volumetric ratio of ethanol-to-water, R_2, is less than the volumetric ratio of ethanol-to-water in the beverage;

c. subjecting the solutions formed in steps (a) and (b) and the beverage to gas-solid chromatography in a column containing a solid, microporous, hydrophobic organic polymeric absorbent of high surface area derived from the copolymerization of divinyl benzene and a vinyl hydrocarbon monomer;

d. passing the beverage and solutions chromatographed in step (c) through a thermal conductivity detector to generate a signal corresponding to each component of the solutions formed in steps (a) and (b) and the beverage;

e. converting the signals generated in step (d) to numerical values corresponding to the volumes of water and ethanol in the solutions formed in steps (a) and (b) and the beverage; and

f. subjecting the numerical values obtained in step (e) to mathematical treatment according to the relationship

wherein $m=\frac{R_1-R_2}{P_1-P_2}$

$$P_x=P_1-\frac{(R_1-R_x)}{m}$$

3,896,660

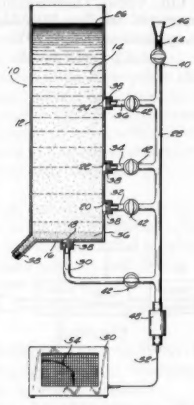
SEDIMENTATION DEVICE

Laszlo Valentyik, Houghton, Mich., assignor to Michigan Technological University, Houghton, Mich.

Filed Dec. 26, 1973, Ser. No. 428,206

Int. Cl. G01n *15/04*

U.S. Cl. 73—61.4 **10 Claims**



1. A device for measuring the settling rate of solid particles suspended in a liquid medium comprising

a settling tube for receiving a quantity of the suspension to be measured;

a pressure sensing port located in said settling tube for liquid communication with the suspension;

a pressure sensing means located in a liquid communication with said pressure sensing port for sensing the hydrostatic pressure being exerted by the suspension at said sensing port and providing an output signal representative of said hydrostatic pressure;

means responsive to said output signal for providing an indication indicative of the weight of the solid particles remaining suspended in the liquid medium during settling of the solid particles from the liquid medium; and

means for isolating the solid particles of the suspension from said pressure sensing means and yet permitting the transmission of said hydrostatic pressure to said pressure sensing means.

3,896,661

METHOD OF COUPLING THIN LAYER CHROMATOGRAPH WITH MASS SPECTROMETER

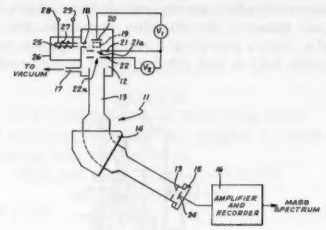
Robert M. Parkhurst, Redwood City, and James H. McReynolds, Palo Alto, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Jan. 9, 1974, Ser. No. 431,938

Int. Cl. H01j *39/34;* **G01h** *31/08*

U.S. Cl. 73—61.1 C **6 Claims**

1. A method for analyzing a mixture of chemical substances comprising the steps of forming a thin layer chromatograph of the mixture whereby differential migration of substances in the mixture forms a succession of absorbed zones of the substances along a chromatograph medium to define the thin layer chromatograph, positioning the thus formed thin layer chromatograph in relatively high vacuum adjacent to and communicating with the ion source of a mass spectrometer,



successively heating each of the absorbed zones whereby as each zone is heated the absorbed substance sublimes directly into the ion source, and forming a mass spectrograph of each of the thus subliming substances.

3,896,662

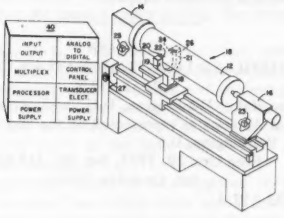
ULTRASONIC MEASURING DEVICE

William S. Camp, Limestone, and Kenneth K. Magnant, Madison, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 27, 1973, Ser. No. 428,951

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—67.8 S **3 Claims**



1. A lathe-like machine for checking a tubular member, said lathe-like machine comprising a bed,

a head stock mounted at one end of said bed,

a tail stock slideably mounted on said bed adjacent the other end thereof and cooperating with said head stock for supporting the tube to be checked,

a yoke assembly slideably mounted on said bed for movement between said head stock and tail stock longitudinally of said tube,

a computer for interpreting data,

sensing means in said tail stock for sensing the position of said tail stock relative to said head stock and relaying said information to said computer thus indicating the length of said tube,

sensing means in said head stock for sensing the rotational position of said head stock and relaying said rotational position to said computer,

sensing means in said bed for sensing the position of said yoke relative to said head stock and continuously relaying said position to said computer,

ultrasonic transducing means in each arm of said yoke for sensing the distance between said arm and the surface of said tube and continuously transmitting said information to said computer,

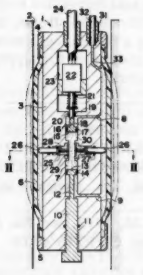
said computer being programmed whereby at certain positions of rotation as sensed by said rotational sensing means a reading is taken of the yoke position relative to

said head stock and a distance reading is taken from said ultrasonic transducing means, whereby a series of such reading will indicate the straightness of said tube.

3,896,663
DILATOMETER

Kimio Ogura, Urawa, Japan, assignor to Oyo Corporation, Tokyo, Japan

Filed June 24, 1974, Ser. No. 482,796
Int. Cl. G01n *33/24*
U.S. Cl. 73—88 E **8 Claims**



1. A dilatometer comprising a sounder body, a flexible tube expansibly mounted to said sounder body, a plurality of detector elements radially extensible through said sounder body and abutting at their respective outer ends against the inside of said flexible tube, a sealed space provided in said sounder body and filled with a liquid therein, said sealed space being radially expansible with extension of said detector elements, a follower member urged toward the liquid filled in said sealed space and displaced by the radial expansion of said sealed space, means for feeding a fluid material inside of said flexible tube, said fluid material being led to said follower member outside of said sealed space, and means for measuring amount of displacement of said follower member.

3,896,664
ENHANCED STABILITY WATER WASHABLE PENETRANT COMPOSITION AND PROCESS

James R. Alburger, 5007 Hillard Ave., La Canada, Calif. 91011

Continuation-in-part of Ser. No. 327,306, Jan. 21, 1973, abandoned. This application June 24, 1974, Ser. No. 482,465
Int. Cl. G01n *21/16;* **C09k** *1/00*
U.S. Cl. 73—104 **1 Claim**

1. In a water-washable inspection penetrant process in which a water-dispersible dyed liquid penetrant is applied to test parts, surface penetrant is removed by washing said test parts with water, and said parts are inspected for residual entrapments of penetrant liquid in surface flaws, the improvement wherein said water-washable penetrant consists essentially of the following formulation, stated in weight percentages:

Low-solubility solvent liquid	30% to 99.8%
Indicator dye	.2% to 30%
Solvent coupler	zero to 40%

said low-solubility solvent liquid being at least one member selected from the group consisting of:

2-ethylbutanol,
2-ethylhexanol,
iso-octanol,
iso-decanol,
decyl alcohol,
2,6,8-trimethyl-4-nonanol,
isopropyl acetate,
butyl acetate,
isobutyl acetate,
primary amyl acetate,
methyl amyl acetate,
phenyl acetate,
ethyl hexyl acetate,
ethylene glycol monobutyl ether acetate,
glyceryl triacetate,
allylidene diacetate,
methyl allylidene diacetate,
ethyl acetoacetate,
methyl vinyl acetate,
diethyl succinate,
2-ethyl-1,3-hexanediol,
methyl isobutyl ketone,
methyl propyl ketone,
isophorone,
mesityl oxide,
methyl-n-amyl ketone,
methyl isoamyl ketone,
ethylbutyl ketone,
di-isobutyl ketone,
1-pentanol,
2-methyl-1-butanol,
3-methyl-1-butanol,
amyl alcohol,
di-isobutyl carbinol,
isobutyl heptyl ketone,
methyl isobutyl carbinol,
propyl acetate,
styrene oxide,
polypropylene glycol (Mol. Wt. 1025),
ethylene glycol monobutyl ether acetate,
diethylene glycol monobutyl ether acetate,
di-(2-ethylhexyl)-adipate,
triethylene glycol di-(2-ethylbutyrate),
triethylene glycol di-(2-ethylhexoate),
polyethylene glycol di-(2-ethylhexoate),
dimethyl phthalate,
dibutyl phthalate,
dioctyl phthalate,
di-isobutyl phthalate,
n-octyl,n-decyl phthalate,
n-hexyl,n-octyl,n-decyl phthalate,
di-(n-hexyl) phthalate,
di-(2-ethylhexyl) tetrahydrophthalate,
aliphatic mineral oils,
low-solubility polyoxyalkylene glycols, and
low-solubility mono and diethers of polyoxyalkylene glycols,

and said solvent coupler being at least one member selected from the group consisting of:

methanol,
ethanol,
butanol,
isopropanol,
1-propanol,
2-butanol,
ethylene glycol monomethyl ether,
ethylene glycol monoethyl ether,

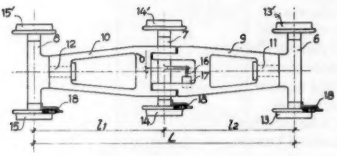
ethylene glycol monobutyl ether,
diethylene glycol monomethyl ether,
diethylene glycol monoethyl ether,
diethylene glycol monobutyl ether,
butoxytriglycol,
methoxytriglycol,
ethoxytriglycol, and
1-butoxyethoxy-2-propanol,
said low-solubility solvent liquids being selectively employed singly and in combination.

3,896,665

RAILWAY INSPECTION METHOD AND VEHICLE

Pierre Goel, Lausanne, Switzerland, assignor to Cannon Inc., Phillipsburg, N.J.

Continuation-in-part of Ser. No. 44,701, June 9, 1970, abandoned. This application Sept. 15, 1972, Ser. No. 289,457
Int. Cl. E01c *23/01*
U.S. Cl. 73—146 **5 Claims**



1. A method for measuring, during high speed travel thereover, the arc deflections in curves and the large faults of short length of at least one line of rails of a railway track, during high speed travel thereover with an inspection vehicle mounted thereon comprising the steps of measuring the relative displacement *d* of a middle feeler means movable relative to a reference line defined by the position of two outer feeler means of a reference means having three feeler means in contact with said line of rails and wherein permanent contact with said line of rails cannot be guaranteed because of their inertia, such method comprising the steps of:

measuring, by means of non-contacting sensor means in the immediate proximity of each of said three feeler means of said reference means, the eventual respective variations *a,b* and *c* between said feeler means and the rail, and thereafter calculating from said measurements the true geometrical characteristics of said track by summing said values *a*, *b*, *c* and *d* according to the formula

$F = d + (a1_1 + c1_2/L - b)$

wherein F is the corrected value of the deflection or of the fault, L is the distance between the outer feeler means of said three feeler means reference means, and 1_1 and 1_2 are respectively distances between said middle feeler means and said outer feeler means.

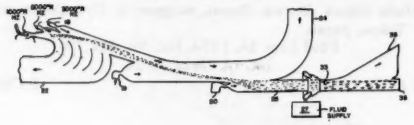
3,896,666

INDUCED AGGLOMERATION SYSTEM FOR USE IN A SYSTEM FOR SIMULATING REENTRY FLOW CONDITIONS

Elmer G. Johnson, 54 N. Grand Ave., Fairborn, Ohio 45324, and Kenneth R. Cramer, 5596 Hugh Dr., Dayton, Ohio 45459

Filed Mar. 25, 1974, Ser. No. 454,200
Int. Cl. G01m *9/00*
U.S. Cl. 73—147 **2 Claims**

1. An induced agglomeration system in combination with an apparatus for generating ultra high total enthalpy gases having a high pressure ratio expansion nozzle; means for supplying a low molecular weight gas to said expansion nozzle to thereby expand the low molecular weight gas to a high speed; means for introducing solid particles of a solid refractory material into the flow of low molecular weight gas whereby the particles are accelerated to the high speeds of the low molecular weight gas; means for separating the low molecular weight gas from the solid particles to thereby provide a separate high energy solid particle stream; means for supplying high temperature air to the solid particle stream; to thereby transfer the energy from the solid particle stream to the air in an energy transfer region and means for separating the solid particles



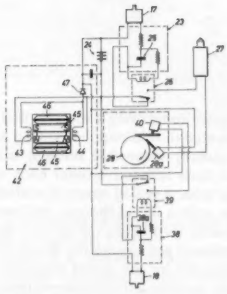
from said air stream; comprising: means for supplying an agglomeration material to the combined solid particle and air stream near the end of the energy transfer region and prior to said separating means; said means, for supplying an agglomeration material to said combined stream, including a plurality of nozzles for directing a flow of agglomeration material into said combined stream and means for supplying the agglomeration material to said nozzles.

3,896,667

METHOD AND APPARATUS FOR ACTUATING DOWNHOLE DEVICES

John D. Jeter, Midland, Tex., assignor to Texas Dynamatics, Inc., Dallas, Tex.

Filed Oct. 26, 1973, Ser. No. 409,910
Int. Cl. E21b *47/00*
U.S. Cl. 73—151 **18 Claims**



1. A method of actuating a downhole device in a drill string comprising pumping fluid down the drill string at a rate to provide a pressure drop across a flow restriction within a preselected range that is different from the range of pressure drops produced during normal drilling operations, maintaining said pumping rate for a predetermined, finite, period of time and actuating said downhole device at the end of the time period.

3,896,668

METHODS AND APPARATUS FOR DETERMINING CHARACTERISTICS OF SUBSURFACE EARTH FORMATIONS

Ronald A. Anderson, and Maurice P. Tixier, both of Houston, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

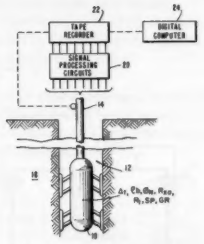
Filed Oct. 5, 1973, Ser. No. 403,786
Int. Cl. E21b *49/00*
U.S. Cl. 73—152 **14 Claims**

1. A machine method of determining elastic constants indic-

ative of the strength of an earth formation traversed by a borehole, comprising the steps of:

a. providing a plurality of well-logging measurements indicative of a plurality of properties of the formation at selected depth levels;

b. combining at least some of said measurements to provide a first parameter indicative of the shale content of the formation at selected depth levels;



c. producing a representation of Poisson's ratio at selected depth levels from said first parameter; and

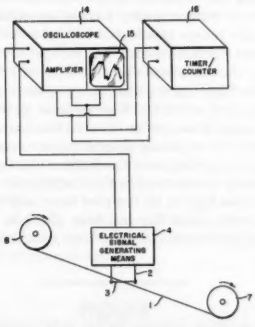
d. combining at least some of said well-logging measurements with said representation of Poisson's ratio to determine at least one of the elastic constants of the formation surrounding said borehole.

3,896,669

METHOD OF AND APPARATUS FOR TESTING THE SURFACE IRREGULARITIES OF A CARBON MONOFILAMENT

Glenroy H. Stecker, Johnson City, and Michael Baud, Elizabethtown, both of Tenn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 20, 1974, Ser. No. 452,908
Int. Cl.[2] G01N *19/08*
U.S. Cl. 73—160 **17 Claims**



1. Apparatus for continuously testing for surface irregularities of a first carbon monofilament comprising;

a. a second filament adapted to contact and rest on the first carbon monofilament,

b. means for linearly moving the first filament relative to the second filament thereby causing vibration of the second filament in the presence of surface irregularities on the first filament,

c. means responsive to the vibration of the second filament in the presence of said surface irregularities for generating an electrical signal representative of said surface irregularities,

d. indicating means responsive to the electrical signal generating means,

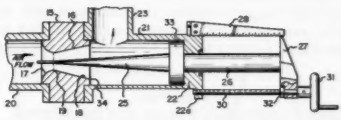
e. adjustable means for tensioning the first filament to provide the proper response of the second filament relative to the varying sizes of the surface irregularities on the first filament.

3,896,670

VENTURI METER

Vernon G. Converse, III, Franklin; Robert W. Clayton, Plymouth, and James T. Westervelt, Livonia, all of Mich., assignors to Scans Associates, Inc., Livonia, Mich.

Continuation of Ser. No. 33,185, April 30, 1970, abandoned. This application Mar. 24, 1972, Ser. No. 237,898. The portion of the term of this patent subsequent to Mar. 24, 1989, has been disclaimed.
Int. Cl. G01f *1/00*
U.S. Cl. 73—213 **5 Claims**



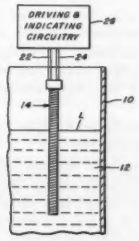
1. A variable area venturi meter adapted to be operated critically at all points of its operating range and comprising a meter body having a venturi passage with a converging section, a diverging section of approximately 12°, and a throat therebetween, a control cone having a straight line generatrix and a cone angle of approximately 3 degrees, said cone operatively mounted within said venturi passage co-axially therewith with the convergence of the cone directed against the flow of the fluid and the thin portion of the cone being located on the converging side of said venturi passage, said cone being selectively movable longitudinally of the venturi passage into and out of the throat to restrict and to enlarge the free area thereof, and consequently of the flow of fluid therethrough.

3,896,671

TEMPERATURE COMPENSATED INDUCTIVE LIQUID METAL LEVEL INDICATOR

Lawrence F. Marinaccio, Big Beaver, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jan. 10, 1974, Ser. No. 432,151
Int. Cl. G01f *23/26*
U.S. Cl. 73—304 R **6 Claims**



1. In a liquid metal level detector of the type in which two coils are inductively coupled together and the presence of surrounding liquid metal varies the coupling between the two, the combination of a source of alternating current voltage connected to one of said coils, means for deriving a first signal which varies as a function of the voltage across said one coil and the temperature of the surrounding liquid metal, means for deriving a second signal across the other of said coils which

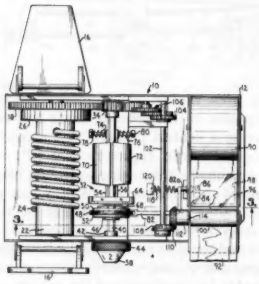
varies as a function of the liquid metal level, and electrical computer means responsive to said first and second signals for electronically synthesizing an output signal proportional to liquid level which is a non-linear function of the magnitudes of the first and second signals.

3,896,672

EXERCISE APPARATUS

Glen E. Henson, Independence, and Milton W. Fisher, Jackson, both of Mo., assignors to Robar Mini-Gym, Inc., Independence, Mo.

Filed July 2, 1973, Ser. No. 375,938
Int. Cl. G011 *5/02*
U.S. Cl. 73—379 6 Claims



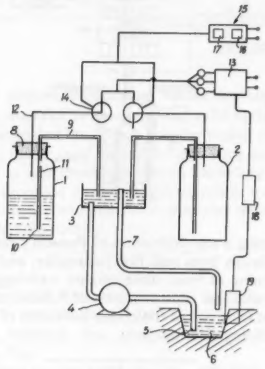
1. Exercise apparatus comprising: a framework;
rotatable shaft means mounted on said framework;
a first member journaled on said shaft and having first and and second frictional surfaces;
a second member rotatably coupled with the shaft and movable longitudinally of the shaft toward and away from said first surface of the first member for engagement with the latter upon rotation of the shaft;
a third member rotatably coupled with the shaft on the side of said first member opposite said second member and movable longitudinally of the shaft into engagement with said second surface of the first member whereby to sandwich said first member between the second and third members;
means adapted to be acted upon by a user of the apparatus for rotating said shaft;
means for moving said second member in the direction of said first member to engage the second member against the first surface of the first member with increasing force as the speed of rotation continues to increase, and for withdrawing the second member from the first surface of the first member as the speed of rotation decreases;
a roll of marking paper mounted on said framework;
a marking instrument for making a mark on the paper corresponding to the magnitude of the exerted force;
a drive roller in engagement with a length of the paper;
a gear train for driving said roller in response to rotation of the shaft; mean for and
yieldable means supported by the framework and disposed for resisting the pivotal movement of said first member.

3,896,673

CONTINUOUS AUTOMATIC LIQUID SAMPLER

Bernard Audouze, Chateau Latapy a, Lagor (64), and Guy Bonometti, 2, allee Nietce a, Mourenx, both of France

Filed May 22, 1973, Ser. No. 363,176
Claims priority, application France, May 29, 1972, 72.19128
Int. Cl. G01n *1/14*
U.S. Cl. 73—421 B 5 Claims



1. An apparatus for continuously taking average samples of a fluid flowing in a channel, comprising a container for holding fluid to be sampled, pump means connected to feed fluid to be sampled at a uniform flow rate from a sampling point of said channel to said container, overflow spout means connected to empty fluid from said container back to said channel at a point below said sampling point in the direction of flow of fluid in said channel, a plurality of sampling bottles, an auxiliary fluid in said bottles, said auxiliary fluid having a density lower than the density of said fluid to be sampled and which will not mix with nor effect the fluid to be sampled in any manner, a suction pump having an adjustable uniform flow rate, tube means connected between said suction pump and the upper portion of each bottle, said tube means terminating above the maximum upper level to which the respective bottle is to be filled during a sampling operation, electro-valve means connected to control flow of fluid in said tube means, programmed clock means connected to control said electrovalve means, and separate siphon tubes connecting each of said bottles, at a point near the bottom thereof, to said container, whereby suction applied to each bottle during a filling operation draws fluid to be sampled from said container to the respective bottle, and the auxiliary fluid in the respective bottle consequently occupies the upper portion of the respective bottle.

3,896,674

SENSOR PROBE CONTROL SYSTEM

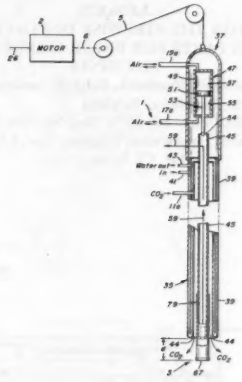
William A. Kolb, Forest Hills, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 1, 1973, Ser. No. 337,250
Int. Cl. G01k *1/14, 7/02*
U.S. Cl. 73—432 R 29 Claims

1. The method of automatically sensing and recording parameters of a bath in a vessel including the steps of:
a. detecting when good electrical contact has been made between a sensor housed in a probe and a recorder;
b. supplying a sensor protecting gas through said probe and around said sensor when said good electrical contact is detected;

c. detecting the flow of the sensor protecting gas;
d. lowering said probe to a predetermined depth within a vessel when said flow of sensor protecting gas is detected;
e. extending said sensor relative to said probe, to a predetermined depth within a bath in said vessel in order to sense and record the parameters of the bath;
f. retracting said sensor into said probe after said good electrical contact is broken or after a maximum duration of time, whichever condition occurs first; and
g. removing said probe from said vessel.

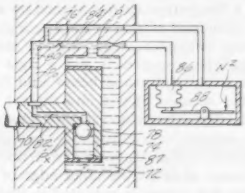
5. For a vessel containing a molten metal bath, apparatus for sensing parameters in the bath and recording said parameters on a recorder, which comprises:
a. a probe;
b. a sensor housed in said probe and electrically connected to the recorder, said sensor being movable with respect to the probe for transmitting signals to the recorder indicative of said bath parameters;



c. means for supplying a sensor protecting gas about said sensor;
d. means for detecting the flow of the sensor protecting gas;
e. means for moving the probe to a predetermined depth in said vessel relative to the bath;
f. means for moving the sensor relative to the probe and into said bath a predetermined distance; and
g. automatic control means for controlling said probe and sensor moving means, which includes;
selectively openable and closable contact means operable in response to the detection of flow of the sensor protecting gas for enabling said probe moving means to lower the probe to said predetermined depth within the vessel; and
means for enabling said sensor moving means to extend said sensor into the bath when the probe has reached the predetermined depth.

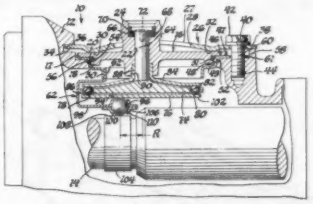
3,896,675
HIGH SPEED HYDRAULIC SENSOR
Charles F. Stearns, East Longmeadow, Mass., and Kenneth P. Hansen, Enfield, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed Nov. 23, 1973, Ser. No. 418,633
Int. Cl.[2] G01P *3/28*
U.S. Cl. 73—497 **6 Claims**

1. A high speed sensor driven by rotating means whose speed is intended to be measured, said sensor including a closed loop fluid circuit having a rotating and nonrotating portion, said rotating portion having fluid pumping means and valve means, a fixed restriction disposed in said nonrotating portion intermediate said valve means and said pumping means in flow relation, said valve means including a ball disposed adjacent an orifice formed in said rotating portion having a preselected buoyancy to impart a force in the direction toward the center of rotation of the rotating portion so as to change the pressure drop across said orifice as a function of fluid density for a given speed of the rotating means, said



pumping means varying the flow through said fixed restriction as a function of speed of the rotating means such that the pressure drop thereacross is indicative of said speed and said buoyant ball maintains a constant pressure drop across said restriction for a given speed of said rotating members.

3,896,676
SPEEDOMETER DRIVE CONSTRUCTION
Leslie K. Walters, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed June 17, 1974, Ser. No. 479,782
Int. Cl. F16h *37/00, 15/08, 13/06*
U.S. Cl. 74—12 **2 Claims**



1. A speedometer drive construction comprising a transmission extension housing, a transmission output shaft extending through said extension housing, a circular opening formed in a side of said extension housing, a flat-bottom surfaced counterbore formed in said circular opening, an adapter plate including a body portion having a radial flange formed thereon, said radial flange being seated on the bottom surface of said counterbore and said body portion being confined freely within the inner peripheral surface of said circular opening, a circular speedometer drive housing having a concentric smaller diameter guide ring formed on the inner surface thereof, said circular housing being mounted in said counterbore and seated on said radial flange, with said guide ring being confined freely within said body portion of said adapter plate, a speedometer take-off shaft opening formed through said speedometer drive housing off-set from the center of said housing, means for manually rotating said speedometer drive housing formed in the outer surface of said drive housing in an equally-spaced relationship with said take-off shaft opening, a circular, bowed clamp having a pair of oppositely disposed tabs extending from the outer peripheral edge thereof and a pair of parallel ridges formed at the respective radially inner edges of said pair of tabs, an opening formed in one of said tabs, a slot formed in said extension housing, the other of said tabs being inserted in said slot, a retention tab formed on the outer peripheral edge of said radial flange of said adapter plate, an opening formed therethrough, a threaded opening formed in said extension housing, a bolt mounted through said opening formed in said one of said tabs

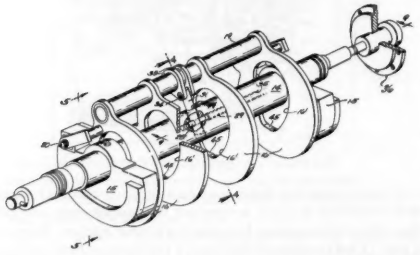
of said clamp, through said opening formed in said retention tab of said adapter plate and threadedly secured in said threaded opening in said extension housing, thereby forcing said pair of parallel ridges into abutting engagement with said adjacent outer surface of said speedometer drive housing, a speedometer take-off shaft rotatably mounted in said take-off shaft opening, a flange-type carrier formed on an end of said take-off shaft within said extension housing, a plurality of ball planets mounted circumferentially around said carrier, a belleville spring-type upper race and a rigid bottom race mounted respectively above and below said ball planets, a reaction member secured at one end thereof to said body portion of said adapter plate and having a radially inwardly extending flat support arm extending from the other end thereof in a spaced-parallel relationship with said bottom race, an opening formed adjacent the inner edge of said support arm, and a drive-ball rotatably mounted in said support arm opening and maintained by said belleville spring-type upper race in a traction-drive relationship between said bottom race and said transmission output shaft, the distance between the center of said drive-ball and the axis of said take-off shaft being variable in response to manual rotation of said speedometer drive housing and, hence, of said take-off shaft mounted in said off-set take-off shaft opening formed in said drive housing.

3,896,677

DUAL AMPLITUDE VIBRATION GENERATOR

Roger L. Larson, Waconia, Minn., assignor to Raygo, Inc., Minneapolis, Minn.

Filed Jan. 18, 1974, Ser. No. 434,565
Int. Cl. F16h *33/00*
U.S. Cl. 74—61 **10 Claims**



1. A dual amplitude vibration generator operable to produce vibration in either a high or a low amplitude mode, comprising:

A. a power driven shaft;

B. a primary weight fixed with respect to the shaft to rotate therewith, with its center of gravity eccentric to the axis of the shaft;

C. a secondary weight;

D. means connecting the secondary weight with the shaft for rotation therewith and for free swinging motion about an axis fixed with respect to and parallel with the shaft, between defined high and low amplitude positions, in the first of which its center of gravity is so located with respect to that of the primary weight that the vibration resulting from its rotation with the shaft augments the vibration produced by the primary weight and in the second of which it partially counterbalances the primary weight,

the freedom of the secondary weight to swing about said axis making it responsive to centrifugal force and enabling centrifugal force to move it from its high amplitude position to its low amplitude position except when restrained against such movement; and

E. means for releasably restraining the secondary weight against response to centrifugal force and thereby causing the vibration generator to operate in its high amplitude mode, said means comprising

1. an axially shiftable control rod carried by the power shaft and constrained to axial movement with respect thereto between operative and inoperative positions; and

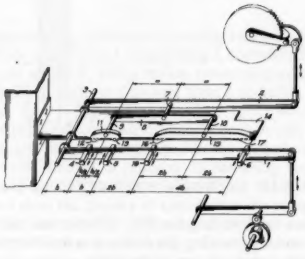
2. means operative when the control rod is in its operative position but not when it is in its inoperative position, to connect the control rod with the secondary weight and by such connection hold the secondary weight in its high amplitude position despite centrifugal force acting thereon, whereby upon shifting of the control rod to its inoperative position the secondary weight is free to respond to centrifugal force and assume its low amplitude position.

3,896,678

DEVICE FOR THE STEPWISE DISPLACEMENT OF WORKING PARTS FOR BRUSH MANUFACTURING MACHINES

Lionel P. Boucherie, Rumbeke, Belgium, assignor to Firma G. B. Boucherie, Rumbeke, Belgium

Filed Mar. 26, 1974, Ser. No. 454,933
Claims priority, application Belgium, Apr. 13, 1973, 798164
Int. Cl. F16h *29/00*
U.S. Cl. 74—116 **12 Claims**



1. A device for stepped displacement of a working part holder comprising:

a support plate;

a spindle mounted on said support plate;

a first lever rotatably mounted on one end thereof upon said spindle and connected at the opposite end thereof to a means for imparting oscillatory motion to said first lever;

a second lever rotatably mounted on one end thereof to said spindle substantially adjacent said first lever, and connected at the opposite end thereof to the working part holder;

a third lever, having first and second ends, rotatably mounted by mounting means to substantially the midpoint of said second lever;

a fourth lever, having first and second ends, rotatably mounted by mounting means at substantially the midpoint thereof to said first end of said third lever;

a plurality of independently selectively extensible pins slidably mounted on said first lever to allow axial extension of said pins;

a contact surface on each said pin; and,

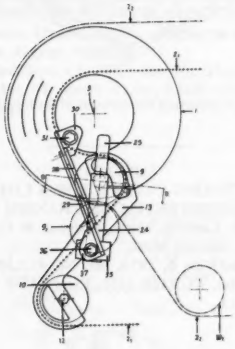
means, at the second end of said third lever and the first and second ends of said fourth lever, for engaging the support plate and for engaging respective ones of said contact surfaces when selective ones of the said pins are extended and the said first lever is oscillated.

3,896,679

BICYCLE DERAILER

Roger Henri Marius Huret, and Jacques André Huret, both of 60, avenue Felix Faure, Nanterre (Hauts de Seine), France

Filed Nov. 19, 1973, Ser. No. 417,215
Claims priority, application France, Jan. 15, 1973, 73.01344
Int. Cl. F16h 9/24
U.S. Cl. 74—217 B 7 Claims



1. A derailer for a bicycle including a driving chain and a free wheel having an axle and an associated plurality of pinions operable to receive said driving chain, comprising a chain-guide roller and a chain-tensioning roller mounted rotatively on spindles carried by a cover-frame, a spindle receiving said cover-frame pivotally and a spring fitted to the cover-frame tending constantly to make it pivot and maintain the driving chain under tension, a control means for controlling the movement of the cover-frame essentially parallel to the axle of the free wheel of the bicycle and for passing the driving chain from one pinion of this wheel to another, the pivot spindle of the cover-frame being mounted on said control means by support means for guiding the free movement of the pivot spindle of the cover-frame toward or away from the axle of the free wheel in a plane essentially perpendicular to said axle in each position of a plurality of positions of the cover frame along the direction essentially parallel to said axle.

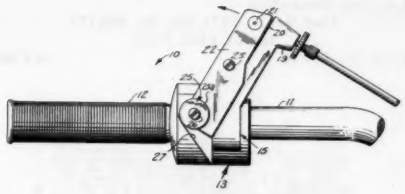
3,896,680

TWIST-GRIP CONTROL FOR MOTORCYCLE CLUTCH

Billy D. Shoemaker, Box 5, Southern Ill. University, Edwardsville, Ill. 62025

Filed July 8, 1974, Ser. No. 486,688
Int. Cl.[2] F16D 41/24; G05G 11/00
U.S. Cl. 74—489 4 Claims

1. A twist-grip clutch for motorcycles, comprising a handle grip cam combination, a cable holding bar clamp retained within said cam, bolt fastener means secured within said clamp, a pivotable actuated lever secured to said clamp with fastener means and a pivotable roller secured to said actuating



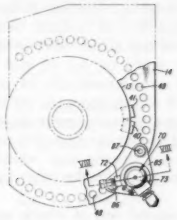
lever, the structure moving cable means of the vehicle's clutch.

3,896,681

UNIVERSAL TRANSFER DEVICE

Robert F. Boyle, Parchment, Mich., assignor to Prab Conveyors, Inc., Kalamazoo, Mich.

Filed Dec. 26, 1973, Ser. No. 428,181
Int. Cl. G05g 5/04
U.S. Cl. 74—526 7 Claims



1. In a universal transfer device including a structural frame, an upstanding vertical post means affixed to said structural frame, stop plate means integral with said vertical post means and normal to the longitudinal axis thereof, a pair of radial stop arms rotatably mounted on said vertical post means and detachably secured to said stop plate means peripherally spaced from each other, yoke means rotatably mounted on said vertical post means above said radial stop arms, a pair of spaced stop lugs peripherally mounted on said yoke means for engaging said radial stop arms at a predetermined radian displacement of said yoke means, yoke motor means on said frame for rotating said yoke means about said vertical post means, and gripper arm means pivotally mounted on said yoke means, the improvement which comprises

an intermediate stop means including a base housing mounted on said stop plate means, a peripheral stop arm journaled in said base housing for movement through a predetermined arc from a rest position to an intercept position and adapted to engage one of said stop lugs when at said intercept position, peripheral stop arm motor means drivably engaging the journaled peripheral stop arm for movement through said predetermined arc, and control means operably associated with the peripheral

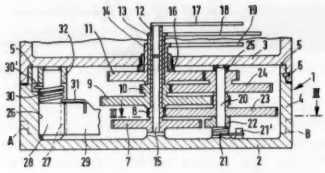
stop arm motor means for energizing said perhipheral stop arm motor means.

3,896,682

MEASURING/INDICATING INSTRUMENT

Alfred Kreidler, Zurich, Switzerland, assignor to Metall-Invent S.A., Zug, Switzerland

Filed Nov. 7, 1973, Ser. No. 406,171
Int. Cl. F16h *57/02*
U.S. Cl. 74—606 R **16 Claims**



1. A measuring or indicating instrument, such as for example a clock, comprising:

a. a housing including

a first support plate (**2**) having three support members on its inner side;

a second support plate (**3**) at least generally parallel to said first support plate;

wall means (**24**) connected to said plates for joining said support plates together; and

b. transmission system means supported by and within said housing for transmitting movement from a movement source to an indicator system including a first set of wheels (**7, 10, 11**) having concentric, hollow shafts (**12, 13, 14**) carrying indicator means at their ends, said ends protruding thorugh an opening in said second support plate, said first set of wheels being concentrically mounted one on top of the other by means of said concentric hollow shafts on one of said support members (15); a second set of wheels (**23, 24**) in engagement with said first set of wheels mounted on the second of said support members; and movement means (**29, 38**) serving as a movement source connected to one (**7**) of said first set of wheels for driving said wheel, said movement means being mounted on the other one of said support members;

said first and second sets of wheels and said movement means being functionally mounted in the radial direction solely by said support members of said first support plate, and said sets of wheels and said movement means being pushed onto or into said support members and being located in the axial direction by both said support plates; whereby said transmission system means can be readily and easily assembled in or disassembled from said housing without difficulty and without special tools.

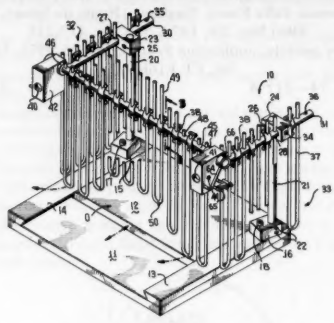
3,896,683

PIVOTAL GUARD FOR PUNCH PRESSES

James A. Dopke, Fox River Grove, and Leland J. Brasile, Woodstock, both of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Nov. 5, 1973, Ser. No. 412,623
Int. Cl. F16p *1/02*
U.S. Cl. 74—612 **15 Claims**

1. A guard for machinery comprising means for at least partially encompassing an area into which might be placed the hand of a worker, said area encompassing means includes a pivotal section, means mounting said pivotal section for free pivotal movement about a generally horizontal axis, first means for abuttingly stopping the pivotal movement of said pivotal section beyond a certain position during its pivoting movement in a direction toward said area, and second means for abuttingly stopping the pivotal movement of said pivotal



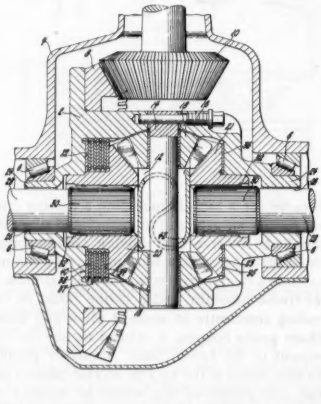
section during its pivoting movement in a direction away from said area.

3,896,684

NON-CHATTERING CLUTCH FOR A LIMITED SLIP DIFFERENTIAL MECHANISM

Morris J. Duer, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 5, 1973, Ser. No. 412,573
Int. Cl. F16h *1/44;* **F16d** *13/68*
U.S. Cl. 74—711 **1 Claim**



1. A limited slip differential mechanism including a rotatable casing, a pair of output members rotatably received in said casing and adapted to be driven thereby, a gear train comprising intermeshing gears rotatably carried in said casing and interconnecting said output members and said casing for rotation together such that rotation of said output members relative to one another causes rotation of said gear train relative to said casing, and clutch means for frictionally connecting two relatively rotatable parts of said differential mechanism so as to resist relative rotation of said output members, said clutch means including a plurality of frictionally engaged clutch elements arranged alternatively in two groups, the elements of one group being connected for rotation with one of said rotatable parts and the elements of the other group being connected for rotation with the other of said rotatable parts, at least one of said elements comprising a clutch plate having generally annular inner and outer members connected by a neck portion over a small portion of their circumferences, said neck portion being adapted to allow relative movement

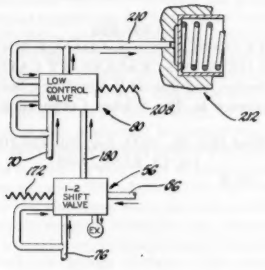
between said inner and outer annular members, said clutch plate being connected for rotation with one of said rotatable parts only through one of said annular members, said outer annular member having an indentation in the radially inner edge thereof diametrically opposite said neck portion and said inner member having a tab projecting radially outward therefrom into said indentation, said tab being adapted to abut one of the ends of said indentation upon relative movement of said inner and outer annular members to limit said relative movement.

3,896,685

TRANSMISSION CONTROL FOR A TRANSMISSION HAVING ONE DRIVE ESTABLISHING DEVICE FOR TWO INDEPENDENT DRIVE FUNCTIONS

Carl E. Shellman, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 12, 1973, Ser. No. 396,569
Int. Cl.[2] B60K *41/04*; **F16H** *5/64*
U.S. Cl. 74—867 **1 Claim**



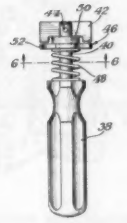
1. A hydraulic control for a throttle controlled engine driven transmission having a fluid operated drive establishing device which is selectively engageable for two distinct drive ratios at different engagement pressures, said control comprising; a source of fluid pressure; control valve means for controlling the engagement of said drive establishing means including a valve bore, a valve spool slidably disposed in said bore, first pressure responsive area means formed by said bore and spool, second pressure responsive area means formed by said bore and spool, passage means interconnecting said second pressure responsive area means and said drive establishing means; and manual valve means for selecting said drive ratios and including a movable member, first control passage means in fluid communication with said first pressure responsive area means for directing fluid pressure from said source to said first pressure responsive area means when one of said drive ratios is selected to move said valve spool to provide fluid communication between said first pressure responsive area means and said passage means to pressurize both pressure responsive areas to engage said drive establishing device with full source pressure, and second control passage means for directing fluid pressure from said source to said passage means when the other of said drive ratios is selected and the pressure in said passage means acting on said second pressure responsive area means to move said valve spool to discontinue fluid communication between said second control passage means and said passage means at a predetermined pressure level, less than source pressure, to engage said drive establishing device at the predetermined pressure level.

3,896,686

BRAKE SHOE ADJUSTMENT TOOL

Morris E. Swinney, 4511 Shoalwood, Austin, Tex. 78756

Filed May 3, 1973, Ser. No. 356,797
Int. Cl. F16d *65/42*
U.S. Cl. 81—3 R **3 Claims**



1. A tool for use with a pair of brake shoes of the type having a shoe surface, a first end for engagement with a pivot pin of a vehicle hub brake assembly and a second end for engagement with adjustable spacing means, said tool comprising, in combination:

a mounting shaft;

a first member fixed to one end of said shaft;

a second member slidably mounted on said shaft; and

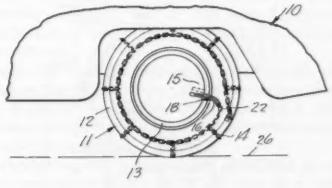
means for biasing said second member toward said first member, said members including means for engaging at least a portion of said first ends of said shoes, one of said members including a projecting pin portion dimensionally equivalent to said pivot pin and positionable between said first ends to space said ends a predetermined distance.

3,896,687

MAGNETIC TIRE CHAIN INSTALLING DEVICE

Sidney C. Cloud, Rt. 1, Box 1834, Shingle Springs, Calif. 95682

Filed Nov. 26, 1973, Ser. No. 418,837
Int. Cl. B60c *27/06*
U.S. Cl. 81—15.8 **4 Claims**



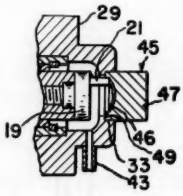
1. A magnetic tire chain installing device, in combination with a wheel having a rim of magnetically susceptable material, an adjustable strap having a hook on one end for engaging a portion of a chain, a magnet having a recessed portion receiving said strap and a portion for engaging said rim, and a securing element in said accessed portion adjustably connecting said strap and magnet together.

3,896,688

METHOD OF EDGING A NON-RIGID LENS

Richard J. Wrue, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Division of Ser. No. 271,431, July 13, 1972, Pat. No. 3,832,920. This application Dec. 17, 1973, Ser. No. 425,414
Int. Cl. B23b *3/00;* B29d *11/00*
U.S. Cl. 82—1 C 2 Claims



1. A method of mechanically working an opthalmic lens with a cutting means while said lens is secured to a mold member and constitutes with said mold member a lens and mold assembly, said lens including a surface which is in engagement with said mold member, an exposed surface and a peripheral edge, said mold including an exposed surface adjacent said edge of said lens, said method comprising:

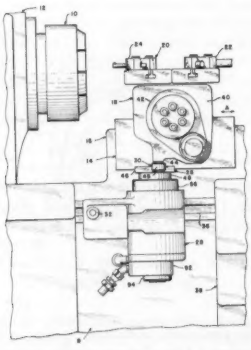
a. orientating said lens and mold assembly such that said exposed lens surface and said exposed mold surface are both in opposed facing relation to said cutting means;
b. inducing relative rotational movement between said cutting means and said lens and mold assembly;
c. engaging said cutting means with said lens and mold assembly;
d. removing, by cutting away, a portion of said edge of said lens; and
e. removing, by cutting away, the portion of said exposed mold surface adjacent said edge.

3,896,689

TAPER TURNING ATTACHMENT

Francis D. Catlin, Horseheads, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Aug. 17, 1973, Ser. No. 389,425
Int. Cl. B23b *5/38*
U.S. Cl. 82—17 19 Claims



1. A taper turning apparatus for a lathe or the like including stationary support means and spindle means for rotating a workpiece, said turning apparatus comprising:

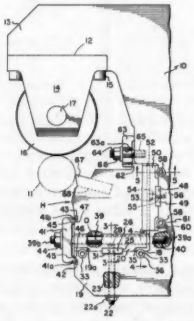
a. a carriage mounted on the lathe support means for reciprocal movement relative to the spindle,
b. a cross-slide mounted on the carriage for reciprocal movement relative thereto,
c. means for moving said carriage and said cross-slide along a selected one of a plurality of paths in relation to the spindle,
d. template supporting means mounted on the stationary support means,
e. a template being mounted on said template supporting means and including a guide face, and
f. follower means extending from said cross-slide and being constrained to move generally in an operating plane in unison with said cross-slide,
g. said template supporting means including means for moving said template guide face transversely to said operating plane between a first position within said operating plane and a second position outside said operating plane,
h. said template guide face being movable from said first position to said second position independently of the position of said follower in said operating plane,
i. whereby when said guide face is in said first position, said follower means will engage said guide face as said cross-slide moves along certain ones of said plurality of paths.

3,896,690

FRONT RELEASABLE, QUICK-CHANGE TOOL HOLDER FOR AN ORBITING CRANKSHAFT LATHE GIRT

Anthony E. Sedlar, and Donald E. Roseberry, both of Saginaw, Mich., assignors to The Wickes Corporation, San Diego, Calif.

Filed Dec. 26, 1973, Ser. No. 428,200
Int. Cl. B23b *29/00*
U.S. Cl. 82—36 B 10 Claims



1. A tool holder and girt assembly comprising:
an orbital girt providing a support platform on which a tool holder may be mounted;
said platform having a front to rear extending upper exterior way with convergent surfaces thereon;
a tool holder with a tool bit at one end having a bottom mating way part with convergent surfaces, normally received by said way so as to be freely lifted bodily upwardly away therefrom; and
front to rear extending clamp means manipulatable from the tool bit end of the holder to releasably clamp the holder and the way in assembled position.

3,896,691

DEVICE FOR THE SIMULTANEOUS DISPENSING AND SEVERING OF WEBS OF WOUND MATERIAL

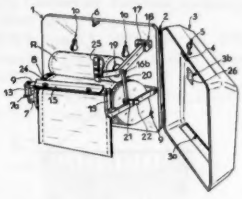
Maurice Granger, 28 Rue Charles de Gaulle, 42000 Saint Etienne, Loire, and Andre Lerond, 174 Rue Leon Blum, 69100 Villeurbanne, Rhone, both of France

Filed Apr. 9, 1973, Ser. No. 349,673

Claims priority, application France, Apr. 27, 1972, 72.15588; Aug. 16, 1972, 72.29761; Dec. 26, 1972, 72.47127

Int. Cl. B65h *35/00*

U.S. Cl. 83—335 22 Claims



1. Device for the simultaneous dispensing and cutting of wound materials, comprising a rotatable drum, an articulated roll-carrier adapted for carrying a roll of material and cooperating by friction with said drum to drive the drum in rotation by simple manual traction on the free end of material extending between the drum and roll carrier and projecting from the device; a severing means for severing the material at the end of traction comprising a fixed portion adjustable in position and a mobile portion driven with said drum and progressively severing the material over its entire width, in the manner of a pair of scissors; a stop positioned to engage said mobile portion and hold the same in an inoperative position and energy storage means coupled to said drum to resist rotation thereof in the direction of unwinding when the free end of the material is being pulled and withdrawn from the device until said severing means cuts the material whereafter the drum is continued to be rotated by said energy storage means in said direction of unwinding until said mobile portion of the severing means again contacts said stop and a fresh length of material is fed from said device.

3,896,692

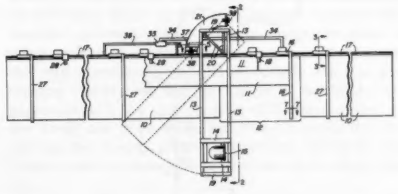
APPARATUS FOR CUTTING ELONGATE ARTICLES

Mayo P. Stubbs, P.O. Box 131, Colorado City, Ariz. 86021

Filed Apr. 16, 1973, Ser. No. 351,152

Int. Cl.[2] B27B *5/20*

U.S. Cl. 83—471.3 13 Claims



1. Apparatus for cutting elongate workpieces comprising and elongate worktable having a substantially horizontal work surface for supporting said workpieces; a guide frame having a pair of parallel track members in a generally horizontal plane above said workpieces on the worktable, said guide frame extending transversely across the worktable at one end of said work surface of the worktable; a support member slidably mounted on said track members, said support member being adapted to mount a power saw thereto, whereby said support member and power saw are movable as a unit along said parallel track members; said worktable having track means extending longitudinally outward from said one end of said work surface in line with one of the sides of said table; an elongate stop member slidably mounted at one of its ends on said track means and extending perpendicularly from said track means whereby workpieces extending longitudinally beyond said one end of said work surface will abut said stop member; and means for releasably securing said adjustable stop member in fixed positions along said track means.

3,896,693

GANG SAW WITH IMPROVED DAMPING MEANS

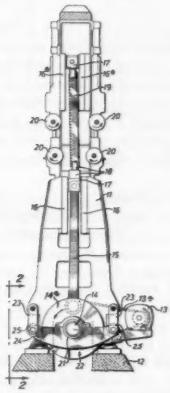
Tage Hjalmar Johansson, Sollentuna, Sweden, assignor to Kockum Industri Aktiebolag, Soderhamn, Sweden

Filed Apr. 5, 1974, Ser. No. 458,358

Claims priority, application Germany, Apr. 13, 1973, 2318820

Int. Cl.[2] B27B *3/12*

U.S. Cl. 83—748 4 Claims



1. In a gang saw having a frame and a driven crankshaft, means for substantially damping out vibrations transferred from the crankshaft to the frame, said damping means comprising:

a. means for operatively journaling said crankshaft said means comprising a cradle

b. means for movably securing said journaling means to said frame wherein said movably securing means allows substantially horizontal displacement of said crankshaft with respect to said frame when said crankshaft has a force applied thereto and,

wherein said movably securing means comprises a plurality of links, each of said links being pivotally connected to said cradle and pivotally connected to said frame,

wherein said links are disposed in substantially parallel relationship to each other which enable said cradle to be displaced in a substantially horizontal direction when a connecting rod imparts a rotational movement to said crankshaft,

said connecting rod is operatively connected at a distal end from said crankshaft to one end of a series of substantially parallel saw blades, said distal end being operatively connected to one end of said saw blades by means of a first sash vertically displaceable within a first vertical guide disposed in said frame, and

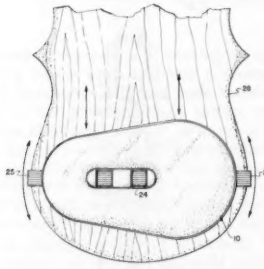
wherein said saw blades have their opposite end being operatively connected by means of a second sash vertically displaceable within a second vertical guide disposed in said frame,

so that when said first sash and said second sash are vertically displaced to a mean vertical position, said

crankshaft will be correspondingly displaced to a substantially horizontal extreme position with respect to said frame, and when said first sash and said second sash are displaced to their extreme vertical positions, said crankshaft will be correspondingly positioned in a horizontal mean position with respect to said frame,

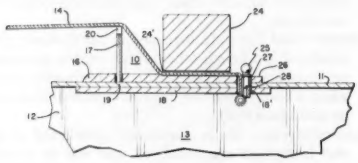
said horizontal mean and extreme positions of said crankshaft resulting from a pendulum-like movement of said cradle caused by forces applied to said saw blades and asid connecting rod from a wood sawing operation.

3,896,694
SHOULDER SUPPORT FOR VIOLIN AND VIOLA
Richard Goldner, 1420 Centre Ave., Pittsburgh, Pa. 15219
Filed July 29, 1974, Ser. No. 492,685
Int. Cl.[2] G10C *3/18*
U.S. Cl. 84—280 **2 Claims**



1. A shoulder support for violin and violas comprising a pliable, inflatable member having an air inlet and exhaust means first and second expandable surfaces sealed together about their outer periphery and including at least two slots extending through said surfaces, said slots being sealed about their peripheries, and a pliable, elongatably resilient attachment strap slidably positioned through said slots and including at each of its ends an angular engagement member adapted to engage the sidewalls of the violin or viola to secure said shoulder support thereto and to retain said engagement by resilent tension of said attachment strap.

3,896,695
BRIDGE FOR MUSICAL INSTRUMENT
Lyle Heath Kingsbury, 1010 N. 31st St., Boise, Idaho 83703
Filed Nov. 16, 1973, Ser. No. 416,698
Int. Cl. G10d *3/04*
U.S. Cl. 84—307 **7 Claims**



1. A bridge for a guitar and similar stringed instrument, comprising;

A bridge block fastened transversely to the uppermost terminal side of the soundboard of said guitar; and

bridge saddles being fabricated of a dense, rigid material and being engageable through said bridge block to contact said soundboard, each of said saddles comprising a base portion which is engageable with receptacles in said bridge block and a head portion of the uppermost terminal end of said base portion, said head portion having a pointed, knife-like uppermost terminal edge of which a string may rest

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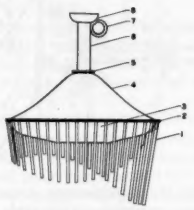
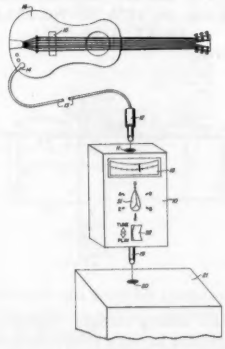
3,896,696
TONAL PERCUSSIVE MUSICAL INSTRUMENT
Richard A. Waters, 1462 Darby Rd., Sebastopol, Calif. 95472
Filed Feb. 15, 1973, Ser. No. 332,564
Int. Cl.[2] G10D *13/08*
U.S. Cl. 84—403 **8 Claims**



1. A musical instrument, comprising a resonator having a hollow body with a flat flexible bottom surface and a rounded top surface, an aperture formed in said top surface at the apex, liquid contained inside said resonator, a neck including a hollow cylindrical tube open at both ends rigidly attached at one end to said resonator covering said aperture and projecting upwardly, and a plurality of tonal rods of various lengths and diameters rigidly attached at one end around the perimeter of said resonator.

3,896,697
DEVICE FOR TESTING THE TUNE OF MUSICAL INSTRUMENTS
Gary L. Iannone, 1072 28th St., Ogden, Utah
Filed Oct. 17, 1973, Ser. No. 407,190
Int. Cl. G10g *7/02*
U.S. Cl. 84—454 **5 Claims**



1. A device for testing the tune of musical instruments comprising a precalibrated, stepwise adjustable, active, band-pass filter for transmitting at any given time an electrical signal of substantially predetermined frequency blocking other signals; indicating means arranged to be operated in response to signals transmitted by said band-pass filter; means for feeding

to the band-pass filter electrical signals corresponding in frequency to the pitch of a tone produced by a musical instrument; by-pass circuitry interconnectable with the feeding means; means for connecting said by-pass circuitry with an output amplifier; and switching means for connecting either said band-pass filter or said by-pass circuitry with said feeding means; and means for providing power to the band-pass filter.

3,896,698

QUICK RELEASE FASTENER

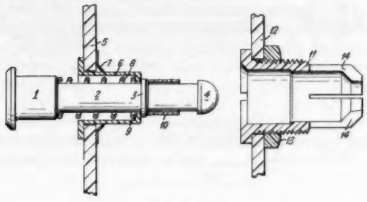
John F. Aylott, Camberley, England, assignor to Dzus Fastener Co. Inc., West Islip, N.Y.

Filed June 13, 1974, Ser. No. 478,834

Claims priority, application United Kingdom, June 29, 1973, 31116/73

Int. Cl.[2] F16B *19/00, 21/00*

U.S. Cl. 85—7 **3 Claims**



1. A quick release fastener useful in releasably connecting two members together which comprises:

a fastener receptacle provided with a base portion for mounting it on one of said members and having an aperture extending therethrough with a tubular cluster of leaf springs surrounding the aperture and projecting outwardly from the base portion and terminating in an inwardly turned end portion with an inner camming surface and an outer locking edge;

a fastener stud assembly including means for mounting it on the other of said members with a stud carried by said mounting means for axial reciprocation and formed with an operating head and a shank portion projecting therefrom for engagement between the tubular cluster of leaf springs in the receptacle, the shank portion terminating in an enlarged knob at the end thereof formed with a rounded camming outer surface to engage the inner camming surface of the leaf springs to spread them apart as the stud is projected into the receptacle and also with a locking shoulder on the inner edge of the knob for engagement with the locking edge of the leaf springs after the knob has been projected therethrough, the shank portion also having a flange projecting outwardly therefrom located between the head of the stud and the knob; and,

a collar slideably mounted on the shank between the flange and knob and being shorter in length than the distance between the knob and flange so that it can slide with respect thereto, the outside diameter of such collar being at least approximately as great as the diameter of such knob so that when the knob is locked beyond the locking edge of the leaf springs and the stud is projected further inwardly to cause the flange to shift the collar to a position between the inwardly turned end portions of the leaf springs, the knob is released from engagement with the locking edge of the leaf springs to permit withdrawal of the fastener stud from the receptacle.

3,896,699

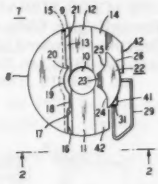
SHELL HOLDER ACCESSORY DEVICE

Daniel Anthony Cerro, 6 Williamson Ln., Chester, N.J. 07930

Filed Mar. 11, 1974, Ser. No. 449,768

Int. Cl. F42b *5/26, 9/26*

U.S. Cl. 86—44 **10 Claims**



1. A loading device for a shell having a rim and a neck and comprising

a base member having

a pair of planar surfaces for supporting said shell rim,

means defining shell primer slots between said pair of surfaces and being depressed in a plane below said surfaces, means providing a shell primer access hole and an arcuate wall projecting in a plane above a portion of a first one of said surfaces for embracing a portion of said neck for aligned registration of a shell primer and said access hole, and

jaw means pivotally and retractably mounted on said base member and having another arcuate wall projecting in a plane above a portion of a second one of said surfaces for embracing another portion of said neck and retaining said aligned registration of said shell primer and said access hole for loading operations.

3,896,700

DRIVING AND STEERING SYSTEM FOR A MOTOR VEHICLE

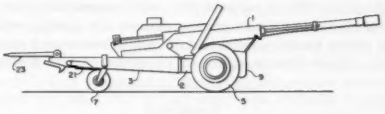
Stig Arthur Johnsson, and Karl Sten Rudolf Hultgren, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Dec. 21, 1973, Ser. No. 427,189

Claims priority, application Sweden, Jan. 17, 1973, 7300599

Int. Cl. F41f *23/24*

U.S. Cl. 89—40 C **3 Claims**



1. A wheeled motor-driven artillery piece comprising a carriage supporting a gun thereon, a pair of horizontally spaced driving wheels supported for rotation on shafts at opposing sides of said carriage respectively, a pair of carriage trails extending from said carriage rearwardly of said driving wheels, a pair of horizontally spaced, freely rotatable wheels pivotally mounted on said pair of carriage trails respectively at positions rearward of said driving wheels, the horizontal spacing between said pair of freely rotatable wheels being substantially equal to the horizontal spacing between said pair of driving wheels, and means for driving and steering said artillery piece comprising a pair of individually reversible hydraulic motors separately coupled to said pair of driving wheels respectively, a pair of hydraulic pumps connected to said pair of hydraulic motors respectively, each of said pumps including a manually operable control for individually controlling the output of each pump independently of the other pump

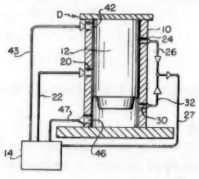
thereby to permit individual control of the speed and direction of rotation of each of said driving wheels, and an engine for driving said pumps, said engine being located below said gun at substantially the level of said driving wheel shafts at a position adjacent to and forward of said shafts.

3,896,701

IMPACTOR-VIBRATOR

John L. Crewse, Parma Heights, Ohio, assignor to The Cleveland Vibrator Company, Cleveland, Ohio

Filed Sept. 17, 1973, Ser. No. 397,973
Int. Cl. F01b *21/02*
U.S. Cl. 91—7 **2 Claims**



1. An impact-vibrator device comprising a single cylinder closed at one end and a single piston reciprocal therein, the other end of said cylinder being normally open and adapted when in use to be closed by a plate; there being an inlet port through the walls of said cylinder at an intermediate portion of its length adapted for connection to a source of compressed gas; there being two vibrator exhaust ports through the walls of said cylinder, one nearer each end of said cylinder respectively, connecting passageways arranged to establish connections between said inlet port and one end of said cylinder when said piston is at said one end; connecting passageways arranged to establish connections between said inlet port and the other end of said cylinder when said piston is at said other end; and means for connecting said compressed gas source to said inlet port, thereby effecting vibrator operation of said device; a combined inlet and exhaust port near said closed cylinder end; a normal impact exhaust port near said open end of said cylinder; and means for connecting said compressed gas source to said combined inlet and exhaust port, while blocking said inlet port and said two vibrator exhaust ports, thereby effecting impact operation of said device; means effective when said piston in use is at said normally open end of said cylinder for connecting said compressed gas source to said normal impact exhaust port, while connecting said combined inlet and exhaust port to exhaust for causing return of said piston to said closed end of said cylinder; and means to select either vibrator or impact operation of said device.

3,896,702

POWER STEERING GEAR WITH RELIEF VALVE ON POWER PISTON

Mahendrakumar Bhogilal Shah, West Lafayette, and Uwe Frank Grossmann, Lafayette, both of Ind., assignors to TRW Inc., Cleveland, Ohio

Filed July 27, 1973, Ser. No. 383,392
Int. Cl. F15b *9/10*
U.S. Cl. 91—375 A **4 Claims**

1. A vehicular power steering system utilizing pressurized fluid for actuating a hydraulic piston against varying supply pressure and pressure surges generated in response to road shock so long as the pressure does not exceed a predetermined value comprising:

an integral power steering gear including

a housing,

means defining a power cylinder in said housing having first and second ports located respectively at the opposite ends thereof,

an axially bored power piston slidably carried in said cylinder and rack teeth carried on said power piston,

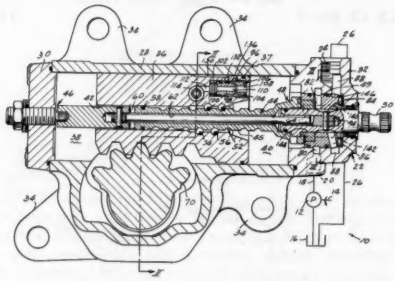
a cross shaft journaled on said housing for rotating about an axis which extends transversely to the axis of said power cylinder and a sector gear carried on said cross shaft in meshing engagement with said rack teeth,

a worm extending in axial alignment into said bore of said piston,

cooperating drive means interconnecting said worm and said power piston for rotating said worm in response to axial movement of said power piston,

a steering shaft journaled on said housing in axial alignment with said worm,

means interconnecting said worm and said steering shaft for rotating said worm in response to rotation of said steering shaft,



steering valve means in said housing operably connected to said steering shaft and movable in response to relative rotation of said steering shaft and said cross shaft in excess of a predetermined relative angle of rotation, and

means defining an inlet port and an outlet port in said housing;

a power fluid pump having a high pressure side and a low pressure side;

a fluid supply header connecting said inlet port to said high pressure side of said power fluid pump;

a fluid return header connecting said outlet port to said low pressure side of said power fluid pump;

first fluid passage means formed in said housing connecting said inlet port to said steering valve means;

second fluid passage means formed in said housing connecting said outlet port to said steering valve means;

third fluid passage means connecting said steering valve means to said first power cylinder port;

fourth fluid passage means connecting said steering valve means to said second power cylinder port;

said fluid supply header and said first fluid passage means constituting high pressure circuits and said fluid return header and said second fluid passage means constituting low pressure circuits,

said steering valve means being movable between a normal position at which fluid communication between said first and second fluid passage means and said third and fourth fluid passage means is open and first and second operating positions at one of which said first fluid passage means is connected to said third fluid passage means and said second fluid passage means is connected to said fourth fluid passage means, and at the other of which said first fluid passage means is connected to said fourth fluid passage means and said second fluid passage means is connected to said third fluid passage means,

said neutral position of said steering valve means obtaining when said predetermined relative angle of rotation between said steering shaft and said cross shaft is not exceeded,

said first operating position obtaining when said steering shaft is rotated in one direction and said predetermined relative angle of rotation between said steering shaft and said cross shaft is exceeded and said second operating position obtaining when said predetermined relative angle of rotation between said steering shaft and said cross shaft is exceeded;

means defining fifth fluid passage means through said piston for fluid communication between the opposite ends of said cylinder; said fifth fluid passage means including

an arcuate peripheral groove in and extending about a portion of said piston in communication with one end of said cylinder;

first bore means extending from said groove to the other end of said cylinder; and

pressure relief valve means disposed in and normally closing said fifth fluid passage means and arranged so as to be subjected to the fluid pressure between the ends of said power piston and the respective ends of said power cylinder and operable to open in response to said predetermined value of pressure to permit fluid flow between the ends of said power cylinder to relieve excess pressure, said pressure relief valve means including

a first valve disposed in said first bore means and normally closing said first bore means and having an axial bore aligned with said first bore means for communication therethrough;

and

a second valve disposed in said first bore means in an opposite flow direction to that of said first valve and normally closing said first bore means.

3,896,703

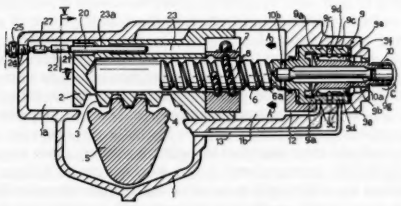
ARRANGEMENT FOR RELIEVING THE MECHANICAL STRESSES IN POWER ASSISTED STEERING FOR VEHICLES IN THE FULL-LOCK STEERING POSITIONS

Battista Bertanza, Segrate (Milan), Italy, assignor to Power-steering Trust Reg., Yriesenberg, Liechtenstein

Filed June 24, 1974, Ser. No. 482,718

Int. Cl. F15b *15/22*

U.S. Cl. 91—401 **6 Claims**



1. An arrangement for reducing the stresses on mechanical parts of an hydraulic power-assisted steering system for motor vehicles at the full-lock steering positions during hydraulic operation, comprising a hollow body defining an hydraulic cylinder having an end wall, a piston mounted displaceably within the said cylinder and defining therein two chambers, and hydraulic distributor means responsive to the steering direction for connecting said chambers selectively to a source of fluid under pressure and to a discharge outlet, wherein the improvement consists in the provision of at least two conduits traversing the piston parallel to its direction of movement, said conduits connecting the two chambers defined by the piston within the hollow body, respective rods secured to and projecting from said end wall, said rods being slidably located within the conduits, the said rods each having a narrow part the transverse cross section of which is less than the internal cross section of the respective conduit whilst the remainder of each rod has a cross section equal to that of the respective conduit to seal the latter, the said narrow part on one of the said rods being positioned on its associated conduit in one end of stroke position of the piston and the narrow part in the other of the said rods being positioned in its associated conduit in the other end of stroke position of the piston whereby in these respective end of stroke positions of the piston the respective conduits are at least partially open.

3,896,704

OPERATIONAL TABLE FOR MEDICAL PURPOSES

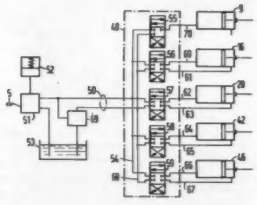
Sigvard Barud, Jarfalla, and Bengt Sedell, Nacka, both of Sweden, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 10, 1973, Ser. No. 349,810

Claims priority, application Sweden, Apr. 18, 1972, 5044/72

Int. Cl. F15b *11/20*

U.S. Cl. 91—413 **4 Claims**

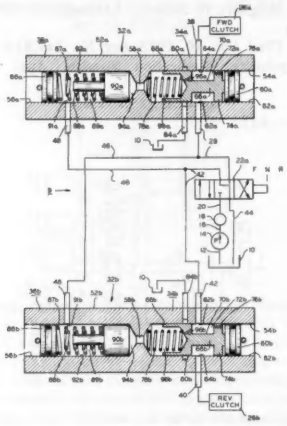


1. An operational table for medical purposes, having a hydraulic operating system, said operating system having a pressure-producing device comprising a pump, a foot pedal actuating said pump and a central valve actuating unit comprising a valve casing having the shape of a hollow cylinder, a dividing member located piston-like in said casing and rotatable about the axis of said casing, a tubular outwardly extending shoulder carried by said dividing member, a cylindrical flange fixed to said casing upon the side opposed to said shoulder, said dividing member and said flange having concentrical passages, an axially movable pin extending through said passages, said flange having an inwardly radially extending working surface, a plurality of working cylinders having flow channels, said flow channels opening in pairs into said working surface and being uniformly divided over its circumference, said dividing member also having a radial working surface extending toward the first-mentioned working surface and sealed relatively thereto, means forming the other flow channels opening into the second-mentioned working surfaces, the openings of said other flow channels being alined with a pair of the first-mentioned flow channels, one of said other flow channels having a channel extension opening into one of said passages, the other one of said other flow channels having a fork-like extension with two side channels, said side channels extending at equal distances from and on opposite sides of said channel extension and opening into one of said passages, said pin having two grooves surrounding the pin and spaced at a distance corresponding to two openings, said pin also having two axial channels communicating with said grooves and extending to an outwardly projecting part of said pin, pressure means connection for the supply and withdrawal of pressure means, said axial channels being connected with said pressure means connection, an axially swingable lever mounted upon the tubular shoulder of the dividing member, said lever swinging said dividing member relatively to said casing about a common axis of symmetry, and means pivotally connecting said lever with said pin and transmitting the axial movement of said lever to make the axial movement of said pin equal to the distance between the two axial channels of the pin, whereby, in the two end positions of said lever, the pressure means connection is crosswise connected with said other flow channels.

3,896,705
PRESSURE FEEDBACK SYSTEM

Jon R. Patton, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Jan. 21, 1974, Ser. No. 435,402
Int. Cl. F15b 11/22
U.S. Cl. 91—413 6 Claims

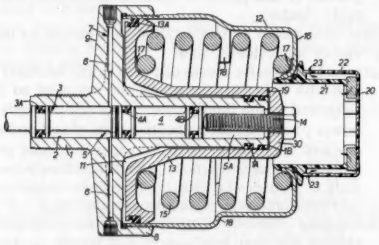


1. In combination with a pair of fluid-pressure-operated devices, a system for actuating said pair of fluid pressure operated devices including fluid-conducting circuit means connecting both of said devices to both a source of fluid under pressure and to tank, a selector valve connected in said circuit means to include the selective admission of pressurized fluid from the source, via said circuit means, into one of said devices and the admission of fluid from the other of said devices, via said circuit means, to tank, a first modulator in said circuit means controlling fluid to said one device, a first accumulator including pressure responsive means dividing said accumulator into two expansible chambers, means connecting said first modulator in series with said first accumulator and providing fluid communication between one of said expansible chambers of said first accumulator and said first modulator, a second modulator in said circuit means controlling fluid to the other of said devices, a second accumulator including pressure responsive means dividing said second accumulator into two expansible chambers, means connecting said second modulator in series with said second accumulator and providing fluid communication between one of said expansible chambers of said second accumulator and said second modulator, each of said modulators including means for bleeding off a portion of the pressurized fluid passing through the said modulator during actuation of its respective device, with each of one of said expansible chambers of said accumulators being charged by said portion of the pressurized fluid and gradually increasing the pressure for actuating its respective device, each of said accumulators also alternately being resettable to a rest position by said pressurized fluid, wherein the improvement comprises the addition of further fluid-conducting circuit means for directly connecting the circuit means passing fluid through said first and second modulators with the other of said expansible chambers of said second and first accumulators, respectively, so as to permit concomitant charging of the accumulator associated with one of said devices while resetting the accumulator associated with the opposite one of said devices to rest position by means of said pressurized fluid.

3,896,706
BRAKE ACTUATOR UNITS

Charles Newstead, and Andrew Charles Wright, both of Birmingham, England, assignors to Girling Limited, Birmingham, England

Filed Feb. 26, 1973, Ser. No. 335,897
Claims priority, application United Kingdom, Mar. 1, 1972, 9538/72; May 31, 1972, 25404/72
Int. Cl. F01b 7/00
U.S. Cl. 92—63 3 Claims



1. An actuator unit for a vehicle wheel brake comprising a pair of fixed, coaxial, radially spaced inner and outer cylinders surrounding an inner and outer chamber, respectively, the inner cylinder extending into the outer chamber and having an outer cylindrical surface, the outer cylinder having an inner cylindrical surface, inner and outer fluid pressure responsive means in the respective cylinders and moveable between first and second positions, said outer pressure responsive means comprising a piston having inner and outer peripheries respectively sealingly engaging and being slideably guided by the outer cylindrical surface of said inner fixed cylinder and by said inner cylindrical surface of said outer fixed cylinder, spring means biassing said piston towards its second position, means for admitting fluid pressure from a first source to said inner cylinder for controlling the movement of the fluid pressure responsive means therein between its first and second positions, means for admitting fluid pressure from a second source to said outer cylinder to effect movement of said piston to its first position in opposition to the biassing force of said spring means when the pressure is above a predetermined level, and means for transmitting the biassing force of said spring means to the inner pressure responsive means to move it to its second position when the pressure in said outer cylinder is below said predetermined level, said inner fluid pressure responsive means comprising an hydraulically operable piston, and said inner chamber including a working space subject to hydraulic pressure and a non-working space subject to ambient air, a third piston in said inner cylinder separate from said inner piston positioned between said working and non-working spaces, said force transmitting means operating on said third piston to transmit a force to said inner fluid pressure means, a pressure seal and a wiper seal carried by said third piston, said wiper seal being interposed between the non-working space and said pressure seal.

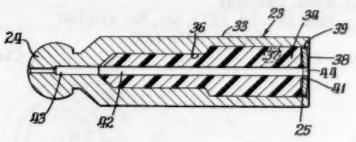
3,896,707
FILLED PISTON RETAINING MEANS WITH EROSION PROTECTION

William L. Holmstrom, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 24, 1973, Ser. No. 391,337
Int. Cl. F16j 1/00
U.S. Cl. 92—172 3 Claims

1. In a piston of the type used in hydraulic translating units, wherein said piston has a base portion for engaging said piston to said unit, and an attached skirt portion with a trailing end, said piston defining a hollowed out cavity extending axially from a plane rearward of said base to an opening in the trailing

end, and a core of filler material within said cavity and essentially filling the same; means for retaining the core of filler material within said cavity including concavo-convex disc core-retaining means press-fitted within said cavity, said disc



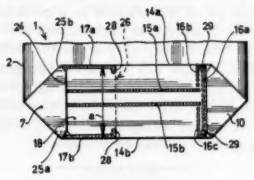
core-retaining means having a press-fit outer edge surface defining an acute angle with respect to said cavity, and said disc core-retaining means having its concave face in contact with an annular protrusion on an end portion of said core filler material positioned within said cavity.

3,896,708

PLASTIC BLOCK BAG WITH A VALVE

Jan Roelof Jochum Hendrik De Vries, Hardenberg, Netherlands, assignor to Industriele Onderneming Wavin N.V., Zwolle, Netherlands

Division of Ser. No. 153,474, June 18, 1971, Pat. No. 3,785,547. This application Oct. 23, 1973, Ser. No. 408,306
Claims priority, application Netherlands, June 17, 1970, 7008908; Jan. 10, 1971, 7101739; Mar. 5, 1971, 7103404
Int. Cl. B31b *1/84*
U.S. Cl. 93—35 R **4 Claims**



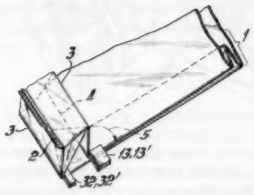
1. A method of manufacturing a plastic block bag with a filling valve from a tubular foil comprising the steps of making from one end of the tubular foil two longitudinal incisions one on each side of the longitudinal center line of the tubular foil to form a first corner flap between one longitudinal incision and the longitudinal edge of the tubular foil situated closest thereto, a second corner flap between the other longitudinal incision and the longitudinal edge of the tubular foil situated closest thereto and a pair of bottom flaps between the two longitudinal incisions; folding outwardly the first corner flap and the second corner flap together with the bottom flaps along folding lines extending at angles toward the one end of the foil from the longitudinal edges to the ends of the longitudinal incisions to form a bottom square with the first corner flap and the second corner flap; folding inwardly the bottom flaps along lines transverse to the longitudinal center line of the tubular foil such that the bottom flaps are in overlapping relationship; inserting a removable partition member between the remaining portion of the first corner flap and the inwardly folded bottom flaps and between the remaining portion of the second corner flap and the underlying portions of the tubular foil; forming first seals to connect the edges of the bottom flaps to each other, forming second seals immediately underneath the bottom flaps to connect the first corner flap with the bottom flaps to form a valve flap; the width of that portion of the removable partition member at least along the effective length of the second seals being smaller than the width of the distance between the bottom flap folding lines of the finished bag with a flattened bottom; and removing the partition member from under the bottom flaps after the seals have been formed.

3,896,709

PROCESS AND APPARATUS FOR MANUFACTURING BLOCK BOTTOM BAGS FROM HEAT-SEALABLE MATERIAL

Friedhelm Brinkmeier, Ladbergen, Germany, assignor to Windmoller & Holscher, Lengerich, Germany

Filed Nov. 14, 1973, Ser. No. 415,514
Claims priority, application Germany, Nov. 14, 1972, 2255768
Int. Cl. B31b *31/26*
U.S. Cl. 93—35 SB **2 Claims**



1. A process of forming block bottom bags from heat-sealable material including the steps of:
- providing a segment of heat-sealable gusseted tubular material;
- supporting said segment on a surface to define top and bottom segment faces;
- forming short seam welds on one end of said segment by welding said top and bottom segment faces together for a distance approximately equal to the width of said gussets while maintaining an air flow passage between said top and bottom faces extending between said gussets;
- forming a pair of transverse score lines on said segment extending across the width thereof spaced apart and from the bottom of said bag;
- holding the segment onto said support by engaging said segment along said score lines;
- separating the top and bottom walls extending between said short seamed end and the score line remote from said seamed end;
- backfolding said separated top and bottom walls;
- flattening said backfolded walls whereby the flat bottom of said bag is formed; and
- completing the seam between said short seams by welding the top and bottom segment faces extending between said gussets.

3,896,710

FOLDABLE TUBULAR PACKAGE APPARATUS

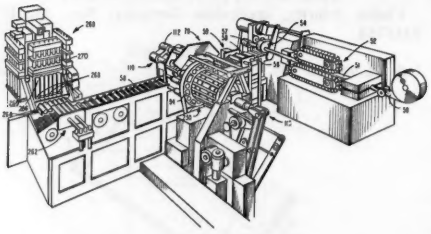
George Henry Holoubek; David Edward Ales, and Harland Elmer Harms, all of Muscatine, Iowa, assignors to Dart Industries Inc., Los Angeles, Calif.

Division of Ser. No. 397,460, Sept. 14, 1973, Pat. No. 3,851,568, which is a continuation-in-part of Ser. No. 376,725, July 5, 1973, Pat. No. 3,823,850, which is a continuation of Ser. No. 214,654, Jan. 3, 1972, abandoned. This application June 10, 1974, Ser. No. 477,939
Int. Cl.[2] B29F *1/10;* **B31F** *1/00*
U.S. Cl. 93—36.8 **5 Claims**

1. An apparatus for producing a collapsible container from tubular blanks comprising:
- transportation means for sequentially moving said blanks to a series of operating stations;
- a first operating station located along said transportation means for crimping and folding an end of said tubular blanks including a revolving carriage frame having a

plurality of mandrels projecting therefrom and including indexing means connected thereto and drive means operating in conjunction with said indexing means to intermittently rotate said frame to predetermined positions whereby individual mandrels will become located directly opposite each of said shaping assembly means;

a reciprocating support means adjacent said frame, said support means having mounted thereon a tube end shaping assembly comprising a crimping means, a twisting



means, and a frusto-conical pressing means each located directly opposite to and concentric with a separate mandrel so that when said support means moves toward said carriage frame, each of the assembly shaping means will engage a blank on said mandrel opposite thereto;

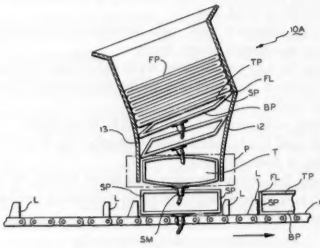
a second station downstream from said first station in the direction of travel of said blanks for shaping the folded end of said tubular blanks into a shoulder and neck portion.

3,896,711

APPARATUS FOR ERECTING CARTON TUBES

Ralph O. Vuilleumier, Malvern, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Mar. 13, 1974, Ser. No. 450,556
Int. Cl.[2] B31B *1/80*
U.S. Cl. 93—53 SD **1 Claim**



1. In a machine for erecting carton tubes having foldably connected panel elements and arranged in a flattened condition thereof;

a. a hopper for holding a stack of flattened carton tubes;

b. said hopper having converging sides defining a throat through which a tube must pass and be constrained in direction corresponding generally to the plane of a certain of said panel elements to cause the tube to be erected;

c. means engageable with a panel element of said carton tubes and operable to move said carton tube through said throat and maintain the constraint thereon to cause partial erection of said tube;

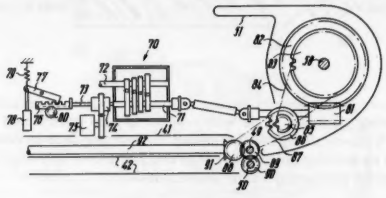
d. plenum means extending along at least one side of said hopper at the throat thereof for applying positive air pressure in the form of a blast of air to complete the erection of said carton tube as it moves through said throat.

3,896,712

APPARATUS FOR MACHINES FOR THE AUTOMATIC PRODUCTION OF POSTAL ENVELOPES

Gunter Ehlscheid, Neuwied, Germany, assignor to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei KG, Neuwied am Rhine, Germany

Filed Dec. 20, 1973, Ser. No. 426,740
Int. Cl. B31b *1/08*
U.S. Cl. 93—61 AC **2 Claims**



1. In a machine for the automatic production of postal envelopes of the type including an echeloning station, a closure flap gumming station, a blank drawing station, and a drying station through which envelope blanks are successively moved by conveyors, means for varying the echelon unit width of the blanks in each of the stations and for varying the speed of the envelope blank conveyors through the stations with the same relative variance of echelon width, the means comprising: a drive shaft connected to drive the blank conveyor at one of the stations; mechanical drive connections from the conveyor at the drive shaft connected station to one of the other stations and from that station to the conveyor at the next station through all of the stations in a predetermined speed ratio so that the conveyor at each station provides a desired echelon width which may vary from the echelon width at another station, a draw key speed change gear in the drive shaft having an axially movable adjusting spindle to effect a speed change in the drive shaft, a controllable motor connected to drive the adjusting spindle, and means for locking the adjusting spindle in desired position.

3,896,713

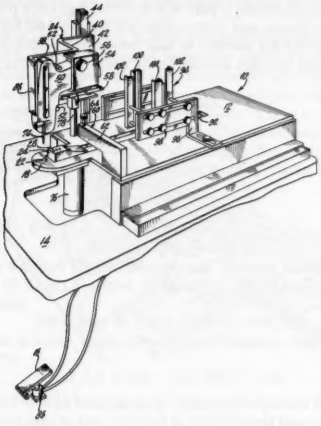
TOP-FEEDING AUTOMATIC TAG-ATTACHING MACHINE

Laszlo Mato, Paramus, N.J., assignor to Ben Clements & Sons, Inc., New York, N.Y.

Filed Dec. 27, 1973, Ser. No. 429,007
Int. Cl. B31f *5/00*
U.S. Cl. 93—88 **13 Claims**

1. In a machine for attaching a tag to an article by means of a bar-lock fastener, support means having an upwardly directed supporting surface on which an article is adapted to be placed in preparation for having a tag attached to the article with a bar-lock fastener, positioning means located adjacent said supporting surface of said support means for positioning a tag at a location situated over and spaced from said supporting surface so that part of the article can be situated on the supporting surface beneath part of the tag between the tag and said supporting surface, carriage means situated at an elevation higher than said supporting surface for carrying a bar-lock dispenser which when triggered upon reaching a dispensing location will dispense a bar-lock fastener and introduce the same downwardly through a tag and article situated therebeneath on said supporting surface, guide means carried by said support means and operatively connected with said carriage means for guiding the latter for downward movement from an upper retracted position to a lower end position situating a dispenser carried by said carriage means at said dispensing location, trigger means carried by said support means and situated in the path movement of a dispenser carried by said carriage means for triggering the dispenser when the latter is situated by said carriage means at said dispensing

location, fluid-pressure means operatively connected with said carriage means for moving the latter along said guide means along a working stroke downwardly from said upper retracted position to said lower end position and along a return stroke upwardly from said lower end position to said upper retracted position, and operator-actuated control means accessible to the operator and operatively connected with said fluid-pressure means for controlling the latter to carry out an operating cycle during which said carriage means is moved along its working and return strokes, whereby after an article is placed on said supporting surface and a tag is positioned by said positioning means over the article the operator can actuate the operator-actuated control means to bring about an operating cycle where the tag will be attached to the article by way of a bar-lock fastener.



3,896,714

PROCESS OF MANUFACTURING BLOCK BOTTOM BAGS

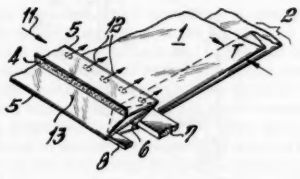
Frank Bosse, Ibbenburen-Dorenthe, Germany, assignor to Windmoller & Holscher, Lengerich, Germany

Filed Nov. 14, 1973, Ser. No. 415,513

Claims priority, application Germany, Nov. 20, 1972, 2256913

Int. Cl. B31b *31/26*

U.S. Cl. 93—35 SB **1 Claim**



1. A process of forming block bottom bags from thermoplastic material including the steps of:

forming a simple bottom seamed, side-gusseted, open mouthed flat bag;

forming a pair of transverse score lines on said bag extending across the width thereof spaced apart and from the bottom of said bag;

supporting said bag on a flat surface to define top and bottom faces of said bag;

holding the bag against the flat surface by engaging said top face at positions adjacent said side gussets and along the score line remote from the bottom seam;

opening said side gussets while the portions of the top and bottom faces extending between said opened side gussets remain in engagement with each other;

holding the bottom part of each said side gusset adjacent said score line nearer said bottom seam;

moving the top face of said bag while in engagement with the bottom face of the bag tangentially with respect to said bottom face in a direction toward the open end of said bag, and in substantially the same plane as said bottom face to effect a peeling of said top face from said bottom face and causing said faces to slip relative to each other;

stopping the tangential movement of said top face when said wall portions are moved into a predetermined position by said tangential movement whereby the flat bottom of said bag is formed.

3,896,715

AUTOMATIC APPLIANCE FOR COOKING AND DISTRIBUTING MEASURED QUANTITIES OF HOT FOOD PRODUCTS

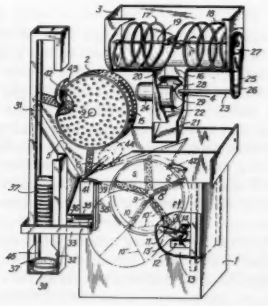
Albert Mascret, 84 rue Voltaire, 02100 Saint Quentin, France

Filed Nov. 22, 1972, Ser. No. 308,845

Claims priority, application France, Nov. 12, 1971, 71.41395

Int. Cl. A47j *37/12*

U.S. Cl. 99—356 **12 Claims**



1. Apparatus for cooking and distributing measured quantities of hot food products, the apparatus comprising a tank for containing a hot cooking liquid; a basket and chute unit consisting of a perforated basket having an aperture and a chute in communication with the aperture for introducing food products into the interior of the basket and for removing food products therefrom; means for moving the unit between a first position in which the basket is immersed in the cooking liquid and a second position in which the basket is withdrawn from the tank; means for partitioning the interior of the basket into sectors each intended to contain one measured quantity of food product, said partitioning means being mounted so as to be rotatable in the basket; a device for imparting rotation to said partitioning means to cause the partitioning means to rotate through one sector each time the basket-and-chute unit moves towards one of said positions of the basket; a magazine for containing a reserve of the food product to be cooked and provided with an aperture through which said product can pour and including means for driving the product towards said aperture; a two-position productmeasuring member which, in a first position, takes from the aperture of the magazine a predetermined portion of product, and in its second position allows said portion to pour into the chute of the basket, a driving mechanism for moving the measuring member in

synchronism with the movement of the basket-and-chute unit; means for receiving a stack of receptacles each intended to receive a cooked portion of product which is tipped from one of the sectors of the basket; and a mechanism for distributing said receptacles in synchronism with the movement of the basket-and-chute unit and operable to bring an end receptacle from the stack into a position accessible to the consumer.

3,896,716

APPARATUS FOR EXPANDING FOOD PRODUCTS

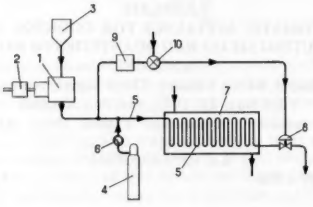
Daniel Carasso, Neuilly-sur-Seine, France, assignor to Compagnie Gervais-Danone, Levallois-Perret, France

Continuation of Ser. No. 227,771, Feb. 22, 1972, abandoned. This application Mar. 19, 1974, Ser. No. 452,533

Claims priority, application Luxemburg, Feb. 19, 1971, 62640

Int. Cl. A23c *9/00*

U.S. Cl. 99—452 **8 Claims**



1. In an apparatus for expanding a food product comprising means for mixing said food product with a gas; pump means connected to supply said food product to said mixing means under pressure; means for introducing said gas into said mixing means downstream of said pump means at a pressure greater than that at which said pump supplies said food product; and pressure-regulating outlet valve means downstream of said mixing means through which a mixture of said food product and said gas emerges from said mixing means; the improvement which comprises pressure responsive control means responsive to the pressure of said food product upstream of said gas introducing means but downstream of said pump means, said control means being connected to said pressure-regulating valve means to control the opening of said valve means in dependence on said food product pressure and thereby maintain a substantially constant pressure drop between said pump and outlet valve.

3,896,717

ROOF TRUSS MACHINE

Jack N. Schmitt, 64 Park St., Troy, Mich. 48084

Filed Aug. 13, 1973, Ser. No. 387,735

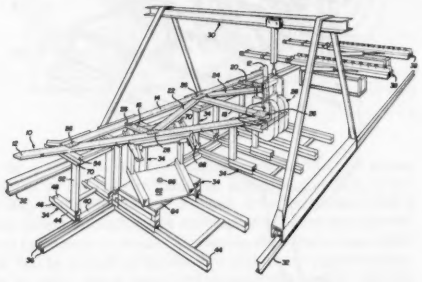
Int. Cl. B30b *15/04*

U.S. Cl. 100—100 **2 Claims**

1. In a machine for assembling wooden trusses from individual abutting structural members joined together by spiked connector plates, wherein the machine is of the type having a plurality of support tables adjustably positioned along a floor track means and arranged to support the horizontally arranged structural members at their points of abutment, and further having a wheeled gantry supporting a C-clamp type press for movement along the outer periphery of the truss to join the truss members together by embedding connector plates into the members at each of the table-supported abutment points, the improvement in said support tables comprising;

a lower frame adapted to slidably engage the floor track means for adjustable positioning therealong; said lower frame including a downwardly opening channel slidably mounted on said floor track means for adjustment of said support table in a first direction, a pair of spaced apart upwardly opening U-shaped lower frame members each having a first end attached to said channel, and a pair of parallel box frames, each slidably superimposed on one lower frame member for adjustment of said support table transversely of said first direction;

an upper support surface adapted to support individual truss members at their point of abutment; said upper support surface including a pair of horizontal legs each parallel to a box frame and interconnected at one end by a third horizontal leg parallel to said downwardly opening channel, said support surface being open on one side; and



a pair of vertical legs rigidly securing said pair of horizontal legs to said lower frame at said one end of said pair of legs so that said upper support surface is cantilevered to said lower frame;

said upper support surface being rigidly secured to said lower frame with the space immediately beneath the one open side of said upper support surface being otherwise completely open and free of any obstruction, whereby the, C-clamp type press can freely move from table to table in a straight path along and parallel to the outer periphery of the truss, without having to move perpendicularly to the sides of the truss to clear tablesupporting legs.

3,896,718

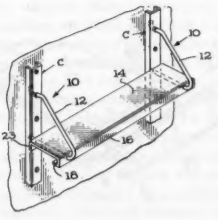
SHELF ARRANGEMENT AND BRACKET THEREFOR

Joseph Giambalvo, 1118 Willoughby Ave., Brooklyn, N.Y. 11237

Filed June 30, 1972, Ser. No. 268,028

Int. Cl.[2] A47G *57/24*

U.S. Cl. 108—108 **11 Claims**



1. A shelf arrangement, comprising:

supporting means having vertically spaced perforations therein;

at least two open triangle brackets, each consisting of two sides, one of said sides comprising an upper extension terminating in a hook having a depressed portion therein, and the other of said sides comprising a generally horizontally extending lower extension connected at one end to the end of said upper extension opposite said hook and

terminating at the other end thereof without the axis thereof departing from said generally horizontal line, the terminal end thereof having a downwardly directed notch therein, said upper extension extending from said horizontally extending lower extension at an acute angle, said upper and lower extensions being resiliently biased to a rest position at which said hook and the end of said lower extension are farther apart than the vertically spaced perforations of said supporting means in which said brackets are engaged; and

a shelf member having at least two apertures through which said lower extensions of respective ones of said brackets extend to support said shelf member in a horizontal position, thereby positively connecting said brackets with said shelf member, the depressed portion of said hook and the notch in the terminal end of said lower extension of each of said brackets lockably engaging the said vertically spaced perforations in said supporting means.

3,896,719

MOUNTING DEVICE

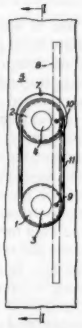
Charles Clifford Owen Goodall, and Edward George Amery, both of Essex, England, assignors to Ilford Limited, Essex, England

Filed May 8, 1974, Ser. No. 468,156

Claims priority, application United Kingdom, May 16, 1973, 23346/73

Int. Cl. B30b *3/04;* **D06f** *45/00*

U.S. Cl. 100—169 **10 Claims**



1. In an apparatus which comprises at least one pair of driven nip rollers a mounting means for the said pair of nip rollers which comprises at each end of the pair of rollers an external mounting plate and an apertured plate, each roller of the said pair having at each end a spindle mounted in a spindle bearing, the bearings passing through one of apertured plates and being connected to one of the mounting plates, the bearing connected to one roller being a fixed pair and the bearing connected to the other roller being a movable pair, the movable pair being biassed towards the fixed pair, each apertured plate having an aperture in which one of the fixed bearings is located and an aperture in which one of the movable bearings is located which is greater in area than the diameter of the movable bearing, each movable bearing being connected to one of the mounting plates by a peg mounted thereon which locates in an aperture which is eccentric with regard to its centre so that the bearing is able to rotate about the peg in a direction towards or away from the fixed bearings, the amount of rotation being limited by the shape of the aperture in the apertured plate in which it is located.

3,896,720

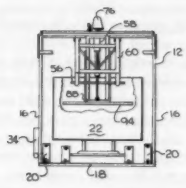
SEEDCOTTON COMPACTER

Charles Don Rhodes, Rt. 2, Petersburg, Tex. 79250

Filed Nov. 8, 1973, Ser. No. 413,926

Int. Cl. B30b *1/32, 15/06*

U.S. Cl. 100—226 **12 Claims**



1. A seedcotton compacter comprising:

a. a skeleton including

i. two rectangular parallel side frames,

ii. connected together at top and bottom, and

iii. open at top, bottom, back, and front,

b. a top side panel for each side frame

i. each of said top side panels being formed of sheet material with

ii. the top edge of the top panel pivoted to the side frame near the top edge thereof,

c. a main panel for each side,

i. each of said main panels being formed of sheet material with

ii. the top edge of each main panel pivoted to the top panel at the bottom edge of the top panel,

d. spacer means on each side frame for spacing the main panels inside and inward of the side frames, and

e. packer means mounted on the top of the side frames for packing seedcotton between the side frames,

f. so arranged and constructed

i. that with the main panels depending downward from the top edge of side frames, then a trailer may be positioned within the side frames and seedcotton dumped therein and packed in the trailer by the packer means, and

ii. that with the main panels spaced inward of said side frames, then seedcotton may be dumped therein and formed into a rick by packing between the main panels by said packer means.

3,896,721

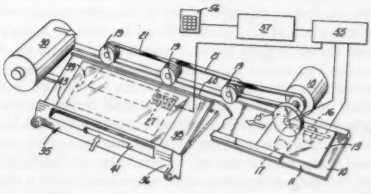
ELECTRONIC DATA RECORDER

Gary G. See, Chagrin Falls, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed June 26, 1973, Ser. No. 373,822

Int. Cl. B41f *3/04*

U.S. Cl. 101—45 **3 Claims**



1. An automated data recorder, comprising:

a data recorder bed;

a card conveyor having means to move a printing token along a transport path;

said conveyor having a path extending between entrance and exit areas;

a reading means at said entrance area of said conveyor for sensing data from a token conveyed thereby;

a print wheel set mounted with the axis of the wheel set stationary with respect to said bed and with the wheel set in printing alignment with said bed for printing variable information on a recording form placed on said bed;

said conveyor transport path extending over said print wheel set for conveying the print token to said bed adjacent said print wheel set;

a movable form carrier having a first position generally above said conveyor and spaced therefrom, and having a second position in contact with said bed;

a roller platen movable from a park position across said bed to a terminus and return for applying imprint pressure to token, wheels, and form on said carrier; and

drive means for moving said carrier into contact with said bed in response to platen movement from said park position and for separating said carrier from said bed to said first position in response to return of said platen to said park position.

3,896,722

MULTI-COLOR PRINTING

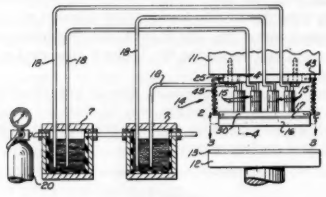
Harold Frederick Farrow, Hitchin, England, assignor to Colorflo Limited, London, England

Filed Aug. 4, 1971, Ser. No. 168,990

Claims priority, application United Kingdom, Apr. 22, 1971, 10883/71

Int. Cl. B05c *3/02*

U.S. Cl. 101—115 **27 Claims**



1. Apparatus for depositing fluid on material in a predetermined design, said apparatus comprising an intaglio plate having at least one recess in one surface thereof corresponding with the design, passage means in said plate connecting the opposite surface of said plate with said recess to deliver fluid into said recess, a fluid injector unit having a housing with a fluid outlet and means for directing fluid under pressure from said outlet into said recess, and means interposed between said fluid injector unit housing and said intaglio plate and having a portion thereof in sealing contact with said housing of said injector unit and another portion in sealing contact with said plate, said means interposed between the fluid injector unit housing and said intaglio plate comprises a resilient gasket member having a projecting portion, said fluid injector unit housing having an opening therein for receiving said projecting portion of said resilient gasket, said opening in said housing and said projecting portion of said resilient gasket having corresponding converging surfaces in sealing contact.

3,896,723

APPARATUS FOR PUMPING FLUID THROUGH A DIE PLATE TO A RECESSED DESIGN

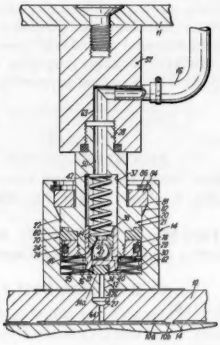
Harold Frederick Farrow, Hitchin, and William Henry Chudley, Henlow, both of England, assignors to Colorflo Limited, London, England

Filed Oct. 16, 1972, Ser. No. 297,863

Claims priority, application United Kingdom, Oct. 14, 1971, 47955/71

Int. Cl. B41f *1/40*

U.S. Cl. 101—150 **7 Claims**



1. A mechanism for use in applying a fluid design onto material comprising, a plate having a recessed design therein in accordance with the fluid design to be applied to the material and at least one passage through the thickness of the plate communicating with said recessed design, a fluid injector unit for delivering a charge of fluid under pressure through said passage to said recessed design, said fluid injector unit including means defining a chamber for the fluid, an inlet valve for controlling fluid flow into said chamber, a normally closed outlet valve which opens upon pressurization of said chamber, a piston member movable to pressurize said chamber to open said outlet valve and force fluid through said passage and into said recessed design, means for relieving the pressure of the fluid in said recessed design, said means for relieving the pressure solely comprising, a pressure relief piston, means biasing said pressure relief piston inwardly against the pressure of fluid in said chamber, and means enabling movement of said pressure relief piston outwardly to relieve the pressure in the chamber when it exceeds a magnitude predetermined by the bias, and said outlet valve comprising one end of said pressure relief piston.

3,896,724

APPARATUS FOR THE ADJUSTMENT OF A FORM CYLINDER

Miloslav Muselik, Hlavni, Czechoslovakia, assignor to Adamovske Strojirny Narodni podnik, Adamov, Czechoslovakia

Filed Jan. 28, 1974, Ser. No. 436,910

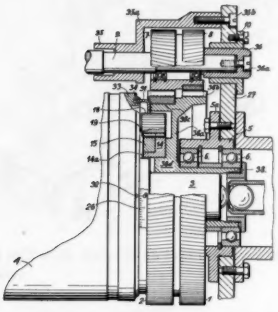
Claims priority, application Czechoslovakia, Jan. 26, 1973, 645-73

Int. Cl. B41f *13/24*

U.S. Cl. 101—248 **10 Claims**

1. In a multicolor offset printing machine having a printing cylinder and a perfecting cylinder, apparatus for circumferentially adjusting the perfecting cylinder for register printing comprising a supporting shaft extending axially from one end of the perfecting cylinder, first gear means comprising an annular helical main gear having a hub rotatably arranged about said supporting shaft and an annular helical drive gear

coaxially mounted on a first shoulder of said hub and rotatable with respect to said main gear, second gear means adapted to mesh with and coact respectively with said main and drive gears, said second gear means being rotatably mounted about an axially movable axle, third gear means secured to said main gear on a second shoulder thereof adjacent the end of the perfecting cylinder, a pinion engaging said third gear means and fixedly mounted on a rod extending into the end of said



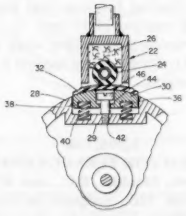
perfecting cylinder and secured thereto, said helical drive gear being adapted to be driven during operation of said printing machine to effect conjoint rotation of said helical main gear and said perfecting cylinder, whereby axial shifting of said axle would cause relative angular displacement of said helical main gear and said helical drive gear consequently causing said third gear means to angularly displace said pinion causing said rod to angularly displace said perfecting cylinder relative to the helical main gear.

3,896,725

ROTATABLE MARKING DEVICE FOR MARKING PREDETERMINED INTERVALS

Bruce C. Grover, Greenville, N.H. 03048

Filed Oct. 11, 1973, Ser. No. 405,284
Int. Cl. B41k *1/22*
U.S. Cl. 101—330 **10 Claims**



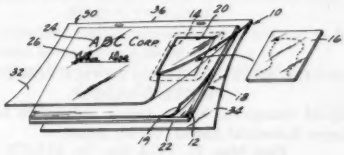
1. In a layout device comprising a roller defining a peripheral surface for rolling along a workpiece for applying position markings at measured positions on the workpiece, an interrupted segment of said peripheral surface and an arcuate stamp body member carrying an ink stamp disposed in said interruption, associated with a supply of marking medium for marking said workpiece upon revolution of said roller, the improvement wherein said stamp body member is resiliently biased outwardly beyond said peripheral surface, but is radially yieldable to move inwardly under pressure of said workpiece, and a fixed member relative to said roller disposed in said interruption, exposed to bear against said ink stamp and thereby through the thickness of said ink stamp upon said workpiece with rotation of said roller, when said interruption reaches said workpiece, said fixed member and the peripheral surface of said roller defining a fixed circumferential length about said roller enabling the avoidance of cumulative error with respect to any indefiniteness in the position of said ink stamp.

3,896,726

EMBOSSED MONOLITHIC IDENTIFICATION CREDIT CARD

Henry N. Staats, Deerfield, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Division of Ser. No. 263,934, June 19, 1972, Pat. No. 3,855,033. This application May 31, 1974, Ser. No. 475,111
Int. Cl. B41n *1/12*
U.S. Cl. 101—369 **4 Claims**



1. A monolithic embossed identification credit card having a protected photograph and signature thereon, said card comprising:

a. a metal plate having an opening with a photograh inserted therein;

b. a folded paper data sheet laminated to both sides of said metal plate and to the edges of said photograph, said data sheet having a cut-out portion overlying said photograph and a signature thereon;

c. a clear pouch having a heat-reactivatible adhesive thereon laminated to said data sheet over said photograph and signature; and

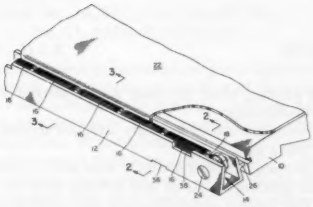
d. embossed indicia impressed into said card with the deformation thereof extending through all layers of said card.

3,896,727

SADDLE LOCK-UP FOR TAB-LESS FLEXIBLE PRINTING PLATES

Charles Bernard Ruckdeschel, Jr., Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Feb. 27, 1974, Ser. No. 446,454
Int. Cl.[2] B41F *27/00, 27/06*
U.S. Cl. 101—415.1 **2 Claims**



1. A saddle lock-up for flexible printing plates comprising:

a semi-cylindrical saddle body having a leading edge and a trailing edge;

leading edge clamping means connected to the leading edge of said saddle to positively grip one end of a flexible printing plate;

a transverse channel member moveably connected to the trailing edge of said saddle body to move toward and away from said saddle body, said channel member having

an upwardly facing inverted wedge-shaped opening therein;

resilient means biasing said channel member away from said trailing edge; and

means mounted within said channel to positively grip a flexible printing plate and to allow lateral adjustment of a printing plate, said means comprising a plurality of transversely spaced sleeves within said channel member, said sleeves radially and axially independently mounted with respect to each other and defining a gap between said sleeves and one side of the inside of said channel member to positively grip the other end of the flexible printing plate in said gap, said sleeves conforming to the thickness of a flexible printing plate independent of each other and allowing lateral movement of the flexible printing plate for purposes of color registration.

3,896,728

PRINTING SHEET GRIPPING DEVICE FOR USE WITH PRINTING SADDLE

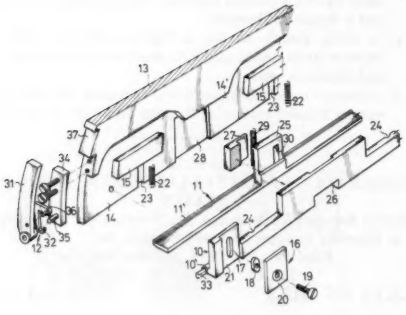
Hiroyuki Nakagawa, Tokyo, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 21, 1974, Ser. No. 453,475

Claims priority, application Japan, Mar. 22, 1973, 48-32958; June 1, 1973, 48-62276

Int. Cl. B41f *27/06, 27/12*

U.S. Cl. 101—415.1 **9 Claims**



1. A printing sheet gripping device affixed to a printing saddle comprising:

a. a holding member slidingly attached to one end of said printing saddle,

b. a gripping member slidingly attached to the same end of said printing saddle as said holding member;

c. a first biasing means between said holding member and said printing saddle to bias said holding member away from said end of said printing saddle and toward said gripping member;

d. a second biasing means between said gripping member and said holding member to bias said gripping member toward said holding member, and

e. gripper opening means engaging said holding member such that movement of said gripper means overcomes said first biasing means and moves said holding member toward said end of said printing saddle and away from said gripping member.

3,896,729

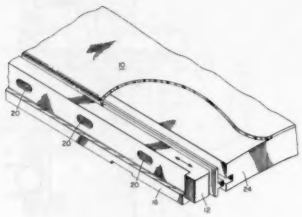
POSITIVE BACKING SHEET PLATE LOCK-UP

Richard Leroy Moyer, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Feb. 27, 1974, Ser. No. 446,455

Int. Cl.² B41F *27/00, 27/06*

U.S. Cl. 101—415.1 **3 Claims**



1. A saddle lock-up for flexible printing plates comprising:

a semi-cylindrical saddle body having a leading edge and a trailing edge;

leading edge clamping means connected to said leading edge to positively secure one end of a flexible printing plate;

trailing edge clamping means moveably connected to said trailing edge to move toward and away from said trailing edge to positively secure the other end of a printing plate, said trailing edge comprising a transverse U-channel parallel and adjacent to said trailing edge of said saddle, a slide bar transversely slideably mounted within said U-channel, said slide bar and said U-channel defining a gap therebetween for one end of a printing plate, said slide bar having camming surfaces thereon on the side opposite said gap and having printing plate gripping means on the side within said gap, and cam adjustment members connected to said U-channel through the side of said U-channel, said cam adjustment members engaging said camming surfaces to move said gripping means within said U-channel to close said gap and positively clamp a flexible printing plate; and

resilient means biasing said trailing edge clamping means away from said trailing edge to tension a flexible printing plate when clamped.

3,896,730

WASH-UP SYSTEM FOR FLEXOGRAPHIC PRINTERS

Clyde Barner Garrett, Mauldin, S.C., and William Stansbury Thayer, Lutherville, Md., assignors to Koppers Company Inc., Pittsburgh, Pa.

Filed Feb. 22, 1974, Ser. No. 445,005

Int. Cl.² B41F *31/20, 35/04;* **B41L** *27/22, 41/04*

U.S. Cl. 101—425 **8 Claims**

1. A method of cleaning a flexographic printing system comprising the steps of:

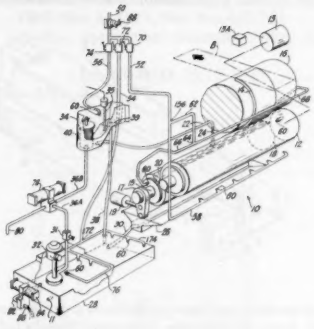
a. stopping the printing function of said printing system;

b. draining residual printing ink from said system including: draining ink from a gravity tank in said system to an ink reservoir beneath said gravity tank; and draining ink from a trough beneath an ink roller in said system to said reservoir;

c. pumping ink drained into said reservoir therefrom into an ink storage container for removal from said system;

d. spraying wash water into said gravity tank and thereafter, spraying wash water onto said ink roller and draining the same into said trough;

e. draining said water from said gravity tank and said trough into said reservoir; and



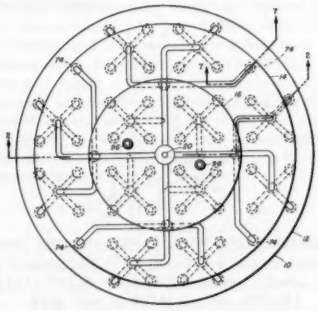
f. draining said wash water from said reservoir to outside of said system.

3,896,731

EXPLOSIVE INITIATOR DEVICE

Earl E. Kilmer, College Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 22, 1970, Ser. No. 83,260
Int. Cl. F42c *19/08;* **F42d** *1/04*
U.S. Cl. 102—22 **3 Claims**



1. An explosive initiating device comprising:

a plurality of contacting, superjacently stacked plate members;

a plurality of arrangements of commonly joined mutually perpendicular mild detonating cords positioned within slots in said members, said arrangements disposed in progressively increasing numbers on all but the lowermost one of said superjacent plate members,

each of said detonating cords having a first explosive charge and a base charge connected to opposite ends thereof,

each of said first explosive charges being disposed at a juncture of each said arrangements formed by said commonly joined detonating cords and each of said base charges being disposed in a through bore formed in all but said lowermost one of said plate members,

each of said junctures of each of said detonating cord arrangements on all but the uppermost and lowermost ones of said plate members being located subjacent of the respective ones of said base charges of a superjacent one of said plate members; and

a plurality of second explosive charges disposed on equidistantly spaced through bores formed in said lowermost plate member, the majority of said through bores in said lowermost plate being positioned immediately subjacent of the base charges of a superjacent one of said plate members;

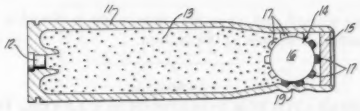
wherein the overall length of the respective paths from a point of initiation on the uppermost one of said plate members to each of said second explosive charges is equal, thereby affording a simultaneous initiation of said second explosive charges in said lowermost plate member in response to the initiation of the intersecting mild detonating cord of said uppermost plate member.

3,896,732

MULTI-SECTION PROJECTILE AND MEANS FOR FIRING THE SAME

Marvin B. Schaffer, Pacific Palisades, Calif., assignor to R & D Associates, Santa Monica, Calif.

Filed Nov. 24, 1972, Ser. No. 309,225
Int. Cl. F42b *5/02*
U.S. Cl. 102—38 **3 Claims**



1. A multi-section bullet and cartridge assembly, comprising:

a cartridge casing including a primer and propellant and having portions thereof defining an opening;

a plurality of flat elements arranged in a face-to-face stack secured within the casing opening with the element edges facing outwardly of the opening; and

said casing portions defining the opening being formed into at least one line of crimp along one side only of the stack and interacting with said elements to impart a spin to said elements in a common direction as said elements leave said casing.

3,896,733

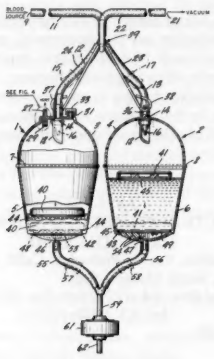
AUTOTRANSFUSION APPARATUS

David J. Rosenberg, Glen Cove, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Oct. 18, 1973, Ser. No. 407,720
Int. Cl. A61m *05/00, 01/03*
U.S. Cl. 128—214 R **15 Claims**

1. An autotransfusion apparatus shaving two chambers with simplified control of the cycling of the flow of fluid between the chambers and safeguards to prevent cross-flow between the chambers and passage of air to a patient from an empty chamber, comprising, in combination, first and second fluid chambers each having a fluid inlet, a fluid outlet, a line connection to a source of vacuum, and a vent connection to atmospheric pressure; the vent being provided with a flow-resistant filter having a pore size such that bacteria cannot pass through it, and restricting flow into the chamber from the atmosphere so that a vacuum can be drawn on the chamber without closing the vent, while allowing the chamber to reach equilibrium with atmospheric pressure when vacuum is not applied; the filter not being wetted by the liquid in the system so as not to accept blood or other medicament in its pores and thus block the passage of air therethrough; a check valve at the fluid inlet restricting flow through the inlet line to flow towards the chamber at fluid pressures within the chamber below the pressure in the inlet line; and means for alternately

opening and closing the vacuum line to each chamber, so that when the vacuum line is open to the first chamber it is closed



to the second; and when the vacuum line is closed to the first chamber, it is open to the second.

3,896,734

APPARATUS FOR CONTINUOUSLY LAYING TRACK

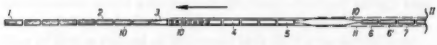
Franz Plasser, and Josef Theuter, both of Johannesgasse 3, Vienna 1, Austria

Division of Ser. No. 785,477, Dec. 20, 1968, abandoned. This application Feb. 8, 1971, Ser. No. 113,758

Claims priority, application Austria, Dec. 29, 1967, A 11824/67

Int. Cl. E01b *29/16*

U.S. Cl. 104—2 **13 Claims**



1. In apparatus for continuously laying successive sections of continuous lengths of track rails, comprising means for placing said successive sections on successive ties and for securing each of said rail sections to said ties, the improvement of mobile means subjecting the successive rail sections to temperature conditioning, said temperature conditioning means preceding the means for placing and securing the rail sections to the ties, and being spaced from the point at which the track rail sections are placed on, and secured to, the ties a distance sufficient to maintain substantially uniformity of the predetermined temperature at said point.

3,896,735

TRACK-TYPE TOY

Artur Fischer, Altheimer Strasse 219, 7741 Tumlingen, Germany

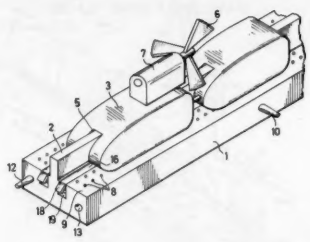
Filed Jan. 16, 1974, Ser. No. 433,981

Claims priority, application Germany, Feb. 19, 1973, 2301893; Feb. 19, 1973, 2308089; Jan. 8, 1973, 2300645

Int. Cl. B61b *13/08*

U.S. Cl. 104—23 FS **15 Claims**

1. In a track-type toy, a combination comprising a toy vehicle; and a track for guiding said toy vehicle, said track being composed of track components forming a guide surface for said vehicle and each having two longitudinally spaced end faces, a conduit adapted for connection with a source of gas under pressure and being composed of conduit sections each associated with a track section and having one projecting end portion extending outwardly beyond one of said end faces, the other end face of each track section being provided with a recess which communicates with the associated conduit section and into which said projecting end portion of the conduit section of another track section is insertable for connecting



said track sections and conduit sections together, and a plurality of at least substantially uniformly distributed openings communicating said conduit with said surface so that the compressed gas escaping through said openings forms above said surface a gas cushion on which said toy vehicle can slide.

3,896,736

ELEVATOR STRUCTURE

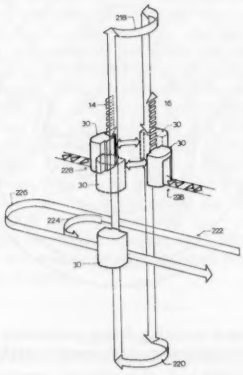
Norbert Hamy, Beaconsfield, Quebec, Canada, assignor to Trebron Holdings Ltd., Regina, Canada

Filed July 6, 1972, Ser. No. 269,453

Claims priority, application United Kingdom, July 7, 1971, 31821/71

Int. Cl. B61j *3/00*

U.S. Cl. 104—88 **17 Claims**



1. A service transport system for use in facilities having a plurality of access stations, said system comprising continuous flow guide rail means, alternate rail means spaced from and cooperating with said guide rail means and being located proximate to said access stations, a plurality of service capsules independently drivable on said guide rail means in a flow direction, selectively operable means for directing a capsule between said flow guide rail means and said alternate rail means, whereby capsules on said flow guide rail means may pass capsules on said alternate rail means, first frame means for supporting said capsules for movement on one of said rail means and for permitting relative shifting movement therealong in the direction of said rail means, and second frame means operatively associated with and cooperating with said first frame means for permitting rotational movement of said capsules about an axis which is relatively perpendicular to said rail means.

3,896,737

SWITCH FOR A SUSPENSION RAILROAD

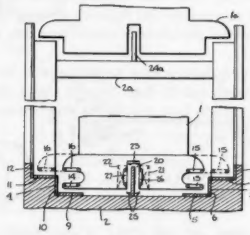
Jurgen Miericke, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 1, 1974, Ser. No. 465,751

Claims priority, application Germany, May 5, 1973, 2322150

Int. Cl. E01b 25/12

U.S. Cl. 104—130 13 Claims



1. In a suspension railroad system wherein vehicles are suspended using the electrodynamic repulsion principle, an improved switch for switching a vehicle from the main roadway lying in a first horizontal plane to a branch roadway lying in a horizontal plane vertically displaced from the first plane comprising:

a. a first electrodynamic suspension system including first means mounted in the vehicle and second means mounted on the main roadway cooperating with said first means;

b. a second electrodynamic suspension system comprising third means located on the roadway outwardly of said first means, and third means extending from said main roadway to the branch roadway in a different horizontal plane and fourth means in the vehicle for cooperating therewith, said fourth means being mechanically movable between a retractd position where they are clear of said third means on the roadway and an extended position where they are above said third means on the roadway to cooperate therewith.

3,896,738

STAGING AND LOADING DEVICE FOR CHAIR LIFTS

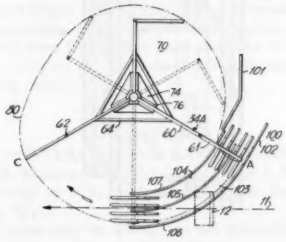
David J. Dubeta, 204-1230 Jasper Ave., and Robert J. Papirnyk, 11313-103 St., both of Edmonton, Alberta, Canada

Filed Apr. 3, 1974, Ser. No. 457,651

Claims priority, application Canada, Apr. 13, 1973, 168748

Int. Cl. B61b 11/00

U.S. Cl. 104—173 12 Claims



1. A ski tow system including

a. a ski tow for moving skiers in sequence up-hill from one position to another by members spaced from one another and movable in sequence along a selected path; and

b. transport means for positively moving the skiers in sequence from the leading end of a line of skiers located at a predetermined pick-up position to a tow line loading zone,

said transport means comprising a central support having at least one arm radiating horizontally outwardly and rotatable about a vertical axis horizontally offset from said predetermined path and positioned to intersect such path in a tow line loading zone, drive means for rotating said arm about said vertical axis, and means momentarily interrupting movement of said arms at each of said skier pick-up position and tow line loading zone during each revolution of the arm about said vertical axis.

3,896,739

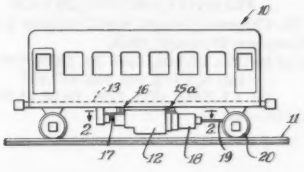
FRANGIBLE RESILIENT ENGINE MOUNTING

John G. Crofts, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 10, 1973, Ser. No. 423,052

Int. Cl. B61c 3/00, 7/00, 17/00

U.S. Cl. 105—133 9 Claims



1. Mounting apparatus for supporting an engine from and below a frame of a vehicle, comprising a plurality of vertical supports, each vertical support being fastened to the engine and being adapted to be suspended from the vehicle frame, each of said vertical supports including rigid means preventing any substantial amount of movement of said engine at shock loads less than a severe impact but collapsing at shock loads above such a severe impact, and a horizontal support fastened to the engine and adapted to be fastened to the frame, said vertical supports being spaced around the center of gravity of the engine to substantially equally distribute the weight of the engine, and said horizontal support being sufficiently rigid in the horizontal fore and aft direction to prevent fore and aft swaying of the engine.

3,896,740

PNEUMATIC BOGIE STABILIZER

Ernst Florian Kreissig, Seuzach, Switzerland, assignor to Schweizerische Lokomotiv-und Maschinenfabrik, Winterthur, Switzerland

Filed Dec. 27, 1973, Ser. No. 428,778

Claims priority, application Switzerland, Jan. 9, 1973, 253/73

Int. Cl. B61f 3/04, 5/24, 5/50

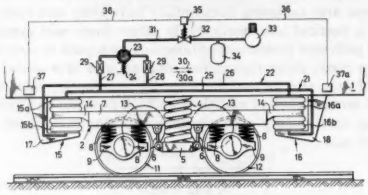
U.S. Cl. 105—164 10 Claims

1. In combination with a vehicle body and a bogie supporting said vehicle body thereon; an axle load compensator comprising

a pair of force transmitting means for imposing a coupling moment on said bogie, one of said means being disposed on one side of said bogie relative to a vertical plane through said bogie and the other of said means being disposed on an opposite side of said bogie, each said means including a pair of opposed pressure elements disposed in vertical relation to each other; and

a pair of connecting lines, each said line communicating an upper pressure element of one force transmitting means with a lower pressure element of the other force transmitting means whereby pressure medium in one force trans-

mitting means is transmitted to the other to impart an upwardly directed compensating force in said other force



transmitting means to oppose a bucking torque imposed on said bogie.

3,896,741

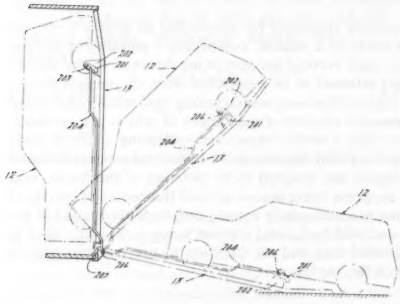
FREIGHT CARRYING DEVICE

Harvey W. Chapman, Detroit, Mich., assignor to Evans Products Company, Plymouth, Mich.

Division of Ser. No. 29,866, April 20, 1970. This application July 6, 1973, Ser. No. 377,097

Int. Cl. B60p *3/06, 7/08;* **B61d** *45/00*

U.S. Cl. 105—368 R **10 Claims**



1. A freight carrying door pivotally supported about a horizontally disposed axis between a loading position in which said door forms a loading ramp onto which an automobile may be driven and a load carrying position in which the transported automobile is oriented in a substantially vertical position, a fixed member affixed to said door and adapted to cooperate with a cooperating member on the automobile for supporting the automobile upon said door when said door is in its load carrying position, hold-down means supported by said door for movement between a disengaged position in which an automobile may be driven onto or off of said door and an engaged position in which said hold-down means cooperates with said fixed member for precluding disengagement of said automobile from said fixed member, and means responsive to movement of said door for moving said hold-down means automatically from its disengaged position to its engaged position upon movement of said door from its loading position to its load carrying position and for automatically moving said hold-down means from its engaged position to its disengaged position upon movement of said door from its load carrying position to its loading position.

3,896,742

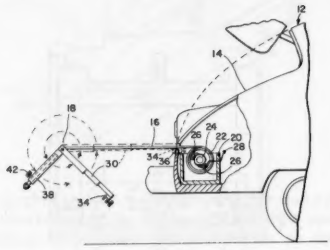
ROLLABLE AND FOLDABLE TABLE FOR AUTOMOBILE TRUNK

Jack E. Ferraro, South Hackensack, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed July 22, 1974, Ser. No. 490,774

Int. Cl.[2] A47B *23/00*

U.S. Cl. 108—44 **3 Claims**



1. A folding and rollable table assembly for automobile vehicles, comprising a retractable table top displaceable between a rolled up storage position and an outwardly extended use position; means secured to one end of said top for urging said top to said rolled up position; and support means fastened to the other end of said top and to said vehicle for temporarily maintaining said top in said outwardly extended position and for supporting same while in use, said support means including a pair of channel members and a pair of legs; said legs being pivoted at one end thereof to said top; said channel members including telescoped portions and clamp means at one end thereof for fastening to said vehicle.

3,896,743

ASSEMBLY DEVICE FOR ELEMENTS CONSTITUTING FURNITURE AND FURNITURE COMPRISING SUCH DEVICES

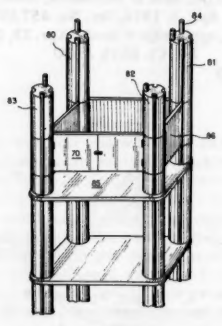
Roger Pariente, 21 Blvd. du Montparnasse, 75006 Paris, France

Filed Dec. 10, 1973, Ser. No. 423,427

Claims priority, application France, Dec. 13, 1972, 72.44271

Int. Cl. A47b *47/04*

U.S. Cl. 108—111 **4 Claims**



1. A piece of furniture, comprising in combination

a. a plurality of parallel posts adapted to provide vertical support for said piece of furniture,

b. at least one panel adapted to be mounted in a horizontal position to said posts and supported thereby,

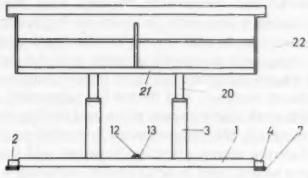
c. said panel being formed with at least one opening at each post,
d. each post comprised of at least two coaxially aligned portions of similar cross-section, one portion on each side of each of said panels,
e. the cross-sectional dimension of each portion being greater than that of said opening,
f. each portion being formed with a plurality of parallel longitudinal grooves C-shaped in cross-section,
g. an elongated solid cylindrical rod mounted in at least one groove of all portions of each post to join said portions, said rod passing through the opening at each post, and
h. at least one wall mounted vertically between a pair of said posts,
i. said wall being formed with connecting elements along opposite edges thereof and of circular cross-section for engagement with grooves in said posts.

3,896,744

HEIGHT-ADJUSTABLE DESK

Adolf Otto Goebl, Hirslandenstrasse 44, 8032 Zurich, Switzerland

Filed June 8, 1973, Ser. No. 368,313
Claims priority, application Switzerland, June 12, 1972, 8689/72
Int. Cl.[2] A47B *9/08*
U.S. Cl. 108—146 **5 Claims**



1. A height-adjustable desk comprising a base portion and a top portion, a pair of support tubes mounted on the base portion, a sliding tube concentrically mounted for telescoping movement with respect to each of the support tubes and connected to the top portion of the desk, a clamping tube located between said sliding and support tubes and mounted for movement between a clamping position and a release position, clamping means mounted on each of said clamping tubes for gripping the sliding tube to hold it in place when the clamping tube is in clamping position and for releasing the sliding tube when the clamping tube is in release position, spring means for biasing each of the clamping tubes toward clamping position, lever means for moving the clamping tubes toward release position so that the top portion can be adjusted to the desired height, said moving means comprising a pair of lever arms pivotally mounted on the base portion of the desk, each of said arms having a portion disposed to engage the associated clamping tube to push it upwardly and disengage the clamping means.

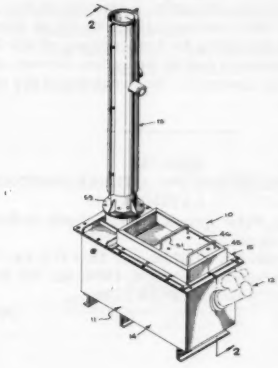
3,896,745

INCINERATOR FOR RAW SEWAGE

Christian M. Mainka, New York, and George A. Nash, Pleasantville, both of N.Y., assignors to Morse Boulger, Inc., Flushing, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,922
Int. Cl.[2] F23G *5/12*
U.S. Cl. 110—8 C **12 Claims**

1. An incinerator for the thermal disposal of raw sewage such as human waste and the like comprising a housing having a primary combustion chamber, a secondary combustion chamber and a mixing chamber intercommunicating said primary and secondary combustion chambers, said housing having means for charging waste material into said primary combustion chamber, a burner mounted on said housing, said burner including means for injecting a flame through said primary combustion chamber and toward said mixing chamber whereby said flame functions to ignite said waste material producing combustion gases, vaporize any liquid constituents of said waste material, produce an induced draft in said primary combustion chamber causing the flow of said combustion gases and said vapor toward and through said mixing chamber, into said secondary combustion chamber, and igniting said mixture of said vapopr and combustion gases for secondary combustion in said secondary combustion chamber, and a flue mounted on said housing for conducting residual combustion gases from said secondary combustion chamber to the ambient atmosphere.

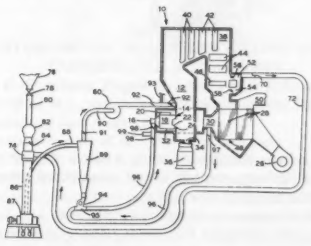


3,896,746

FUEL PREPARATION SYSTEM

Edward A. Pirsh, Akron, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed June 13, 1974, Ser. No. 479,067
Int. Cl.[2] F23K *1/04*
U.S. Cl. 110—104 R **3 Claims**



1. In combination with a vapor generator, walls defining a secondary furnace and a passageway in gas flow receiving communication therewith, a cyclone furnace discharging heating gases to the secondary furnace, means supplying heated combustion air and fuel to the cyclone furnace, said air supply means including a windbox communicating with the cyclone furnace and delivering thereto a major portion of the required combustion air, an air duct leading to the windbox, said fuel supply means including a source of high moisture

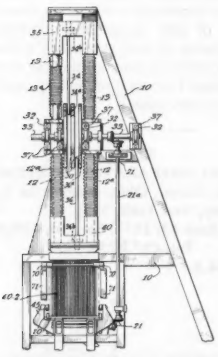
content solid fuel, a crusher for comminuting the fuel, a first conduit for delivering the fuel to the crusher, said first conduit including a mix chamber, a second conduit for conveying heating gases from the passageway to said chamber for mixing with the fuel to evaporate moisture therefrom, a fan for promoting the flow of heating gases through said fuel supply means, a centrifugal separator receiving the outflow from said crusher and separating the moisture laden gases from the comminuted fuel, a third conduit for venting the moisture laden gases from the separator to said secondary furnace, and a fourth conduit receiving the fuel from the separator, said fourth conduit having an outlet discharging to the cyclone furnace and an inlet communicating with the air duct to receive heated air therefrom for further drying of and for conveying the comminuted fuel to the cyclone furnace, said last named heated air comprising the remainder of the required combustion air.

3,896,747

MACHINE FOR PRODUCING A THREE DIMENSIONAL LATTICE

Homer C. Amos, Palm Springs, Calif., assignor to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 272,736, July 18, 1972, Pat. No. 3,822,463. This application May 6, 1974, Ser. No. 466,974
Int. Cl.[2] D05B *23/00*
U.S. Cl. 112—2 **30 Claims**



1. A machine capable of using a three dimensional grid structure to arrange strands into a preselected three dimensional lattice array, comprising:

a. a frame having a grid structure support;

b. transporting means for moving the grid structure in a preselected series of cycles, each cycle comprising a move period and a dwell period, the transporting means being mounted on the frame;

c. introducing means for feeding multiple strands into the grid structure to form a three dimensional lattice array, the introducing means being mounted on the frame;

d. reciprocating means for reciprocating the introducing means relative to the support during the transporting means' dwell period; and

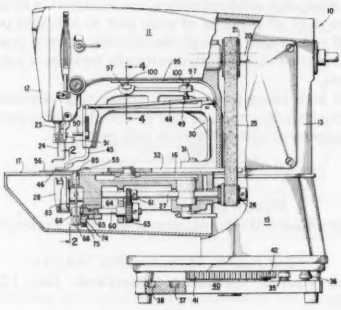
e. strand tensioning means mounted on the reciprocating means.

3,896,748

LOW FRICTION MEANS FOR SEWING MACHINE WORK CLAMP

Stanley Kostenowczyk, Cranford, N.J., assignor to The Singer Company, New York, N.Y.

Filed Oct. 4, 1974, Ser. No. 512,795
Int. Cl. D05b *3/04*
U.S. Cl. 112—70 **5 Claims**



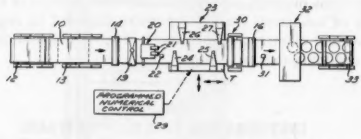
1. In a sewing machine having a frame, a sewing needle, means for reciprocating said sewing needle upwardly out of work material and downwardly through work material, said frame including a bed with an aperture for accommodating said reciprocation of said sewing needle, work clamp means for supporting and transporting work material on said bed, said work clamp means including an upper clamp member and a lower clamp member, and means for supporting and transporting said work clamp means when said sewing needle is out of work material, the improvement comprising: at least one ball and bearing means effective between said bed and said work clamp means, said bearing means including a socket for receiving said ball; means for shifting said bearing means to position said ball in a space between said bed and said work clamp means lower clamp member in synchronism with said upward needle reciprocation to elevate said work clamp means by said ball impinging on said lower clamp member prior to transport of said work clamp means.

3,896,749

AUTOMATED SEWING APPARATUS

Frank Brauns, Deerfield Beach, and James B. Jones, Lighthouse Point, both of Fla., assignors to Novatronics, Inc., Pompano Beach, Fla.

Filed Nov. 16, 1973, Ser. No. 416,419
Int. Cl.[2] D05B *21/00*
U.S. Cl. 112—121.12 **19 Claims**



1. In an apparatus for sewing together webs of material, said apparatus including sewing machine means, and means for supplying webs to be sewed together, the improvement which comprises the combination of:

means for moving said sewing machine means along a predetermined two-dimensional stitching pattern;

and means for advancing the webs in overlapped relationship continuously at substantially constant speed and under substantially uniform tension past said sewing ma-

chine means while the latter are moved through said two-dimensional pattern to sew corresponding stitch patterns in the overlapped webs.

3,896,750

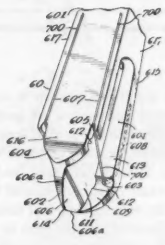
MACHINE AND METHOD FOR PRODUCING A THREE DIMENSIONAL LATTICE

Homer C. Amos, Palm Springs, Calif., assignor to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 272,736, July 18, 1972, Pat. No. 3,822,463. This application May 6, 1974, Ser. No. 467,064

Int. Cl.[2] D05B *85/00*

U.S. Cl. 112—222 **1 Claim**



1. A needle comprising:

1. an elongated shank having a pointed distal end and a proximal end;
2. a hole and a slot substantially the same distance from the distal end, the slot's open end being directed towards the distal point; and
3. an axial groove placed between the hole and the slot so that a thread through the hole and the slot spans the groove.

3,896,751

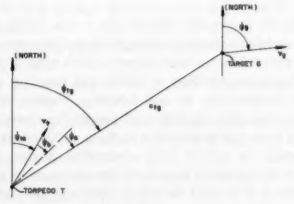
NAVIGATION METHOD

Werner Ammon, Frankfurt am Main, Germany, assignor to Licentia-Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Sept. 20, 1971, Ser. No. 182,198

Int. Cl. F42b *19/06, 19/01, 19/10*

U.S. Cl. 114—23 **5 Claims**



1. In a method for advancing the impact point of a projectile equipped with a passive search head, which projectile is steered by controlling the rate of change of the projectile-to-target heading and, during the autonomous phase, by proportional navigation, wherein, in the vicinity of the barget, there is a switch-over from proportional navigation to navigation along a deviated pursuit course wherein the squint angle is such that the first point of intersection of the spiral path with the track being made good by the target is approximately amidship of the target, the improvement comprising the steps of setting the amplification of the control circuit to unity gain at the instant of switch-over from proportional navigation to navigation along a deviated pursuit course, and applying to the control circuit a constant d.c. voltage throughout a predetermined, finite time interval, with the magnitude of said d.c. voltage and said time interval being selected to produce the desired squint angle.

3,896,752

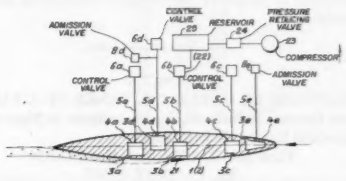
HYDROFOIL FOR WATERCRAFT WITH LIFT GENERATION THROUGH AIR SUPPLY OF THE FOIL UNDERSIDE

Hanns von Schertel, Hergiswil, Switzerland, assignor to Supramar AG, Lucerne, Switzerland

Filed June 4, 1973, Ser. No. 366,796

Int. Cl. B63b *1/24*

U.S. Cl. 114—66.5 H **8 Claims**



1. System for generating lift at a hydrofoil for watercraft, the hydrofoil having air exit openings extending in the span width direction thereof, the lift of said hydrofoil being influenced by the admission of a controllable quantity of air to the negative pressure region of the hydrofoil through said air exit openings, the improvement comprising said hydrofoil profile having an approximately linear mean line such that chord parallel flow generates insufficient lift to support the weight of said watercraft, means for generating sufficient lift to support the weight of said watercraft, said lift generating means comprising said air exit openings being located on the underside of the foil profile, a wedge positioned forwardly of said air exit openings and extending to a point below the profile of said hydrofoil, said wedge having a rearwardly directed blunt edge, means for continuously supplying a quantity of air to said air exit openings and means for varying the quantity of air admitted to said air exit openings for regulating the lift.

3,896,753

HYDROPHILIC POLYMER COATING FOR UNDERWATER STRUCTURES

Thomas H. Shepherd, Hopewell, and Francis E. Gould, Princeton, both of N.J., assignors to National Patent Development Corporation, New York, N.Y.

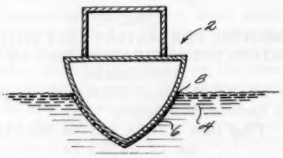
Continuation-in-part of Ser. No. 838,269, July 1, 1969, Pat. No. 3,575,123, which is a continuation-in-part of Ser. No. 654,044, July 5, 1967, abandoned, which is a continuation-in-part of Ser. No. 650,259, June 30, 1967, abandoned, which is a continuation-in-part of Ser. No. 567,856, July 26, 1966, Pat. No. 3,520,949. This application Jan. 14, 1971, Ser. No. 106,374. The portion of the term of this patent subsequent to Apr. 13, 1988, has been disclaimed.

Int. Cl. B63b *1/34*

U.S. Cl. 114—67 R **12 Claims**

1. A marine structure which is a watercraft having an adherent continuous exposed coating consisting essentially of a member of the group consisting of (1) a water insoluble hydrophilic polymer which is swellable to an extent of at least 10% in water and contains vinyl pyrrolidone units, wherein said vinyl pyrrolidone units contribute significantly to the water swellability, wherein the coating is sufficient to reduce

the drag of the watercraft when in water and, (2) said hydrophilic polymer having releasably entrapped therein at least



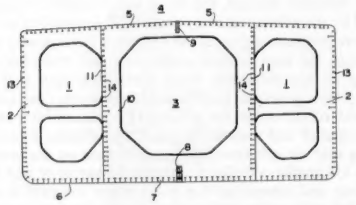
one member of the group consisting of antifouling agents and pigments.

3,896,754

STRUCTURE OF CARGO OIL TANKS OF A TANKER

Minoru Tanaka, Kamakura, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 2, 1974, Ser. No. 429,826
Int. Cl.[2] B63B *25/02*
U.S. Cl. 114—74 R **1 Claim**



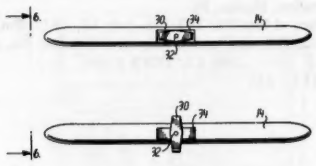
1. Cargo oil tank structure of a tanker comprising a support structure for a center tank and for two outboard wing tanks one on each side of the center tank, said support structure including a deck transverse web under the deck, a bottom transverse web at the bottom, and transverse webs on either side of the center tank, said deck web, bottom web and transverse webs defining an integral ring shaped web structure surrounding the entire circumferential wall of the center tank, longitudinal bulkheads to which each of said side transverse webs are connected, lateral transverse webs secured to said bulkheads and extending outboard thereof to support said outboard wing tanks, said lateral transverse webs for the support of the outboard wing tanks extending partially around said wing tanks and being secured to said longitudinal bulkheads to leave a section without lateral transverse web at said bulkheads, center line girders disposed at the center of the center tank support structure and connected respectively to said deck transverse web and said bottom transverse web, first longitudinal stiffeners at the periphery of said deck and bottom transverse webs of the center tank support structure and at the inner wall of the longitudinal bulkheads on the side of the center tank, and second longitudinal stiffeners at the top and bottom of the lateral transverse webs of the wing tank support structure and the outboard lateral edges of said transverse webs of the wing tank support structure.

3,896,755

HEAVE DAMPING DEVICE FOR SHIPS

Fendall Marbury, North Chevy Chase, Md., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jan. 21, 1974, Ser. No. 434,893
Int. Cl.[2] B63B *39/06*
U.S. Cl. 114—126 **6 Claims**



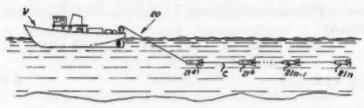
1. Fin means for stabilizing a ship in water comprising at least one fin disposed connected to said ship in relatively horizontal relationship with the hull of said ship, said fin being selectively operable for rotation beneath water level about a vertical axis relative to said ship, said fin including relatively smooth, flat, horizontally disposed blades balanced about the connection of said fin with said hull of said ship, wherein said balanced fin is so balanced that the sum of the moments of the vertical water forces acting on said horizontally disposed flat blades equal zero at any given moment, when the ship is stationary.

3,896,756

DEPTH CONTROL APPARATUS FOR TOWED UNDERWATER CABLES

Raymond H. Pearson; Thomas E. White, both of Richardson, and James R. Perkins, Dallas, all of Tex., assignors to Whitehall Electronics Corporation, Dallas, Tex.

Filed Feb. 2, 1971, Ser. No. 112,002
Int. Cl. B63b *21/56*
U.S. Cl. 114—235 B **8 Claims**



1. A depth controller device for a tow cable including: a body securable to the tow cable; diving planes mounted on the body for pivotal movement about a pivot axis; operator means on said body comprising a cylindrical housing and a piston movable reciprocally in said housing; biasing means in said cylindrical housing biasing said piston for movement in one direction; said piston having a surface exposed to the pressure of the water in which said controller device is immersed whereby said piston is biased by the pressure of the water for movement in a second direction opposite said one direction; connector means connecting said operator means to said diving planes whereby said diving planes are pivoted in one direction when said piston moves in said one direction and are pivoted in a second direction when said piston moves in said second direction; said biasing means comprising spring means and compression means for compressing said spring means, said spring means being disposed in said cylindrical housing between said compression means and said piston; moving means comprising driving means for moving said compression means toward and away from said piston to vary the force with which said spring means yieldably resists movement of said piston toward said compression means, said driving means comprising reversible motor means in said body and a drive screw engaged with said compression means for moving said

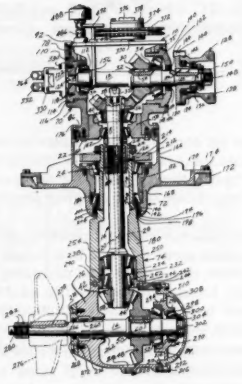
compression means selectively in opposite directions along said drive screw, control means for controlling operation of said motor means, and transducer means in said body operatively associated with said drive means providing an electric quantity which varies in accordance with the longitudinal position of said compression means relative to said drive screw.

3,896,757

ROTATABLE DOWNWARDLY DIRECTED DRIVELINE

Robert C. Kucher, Seattle, Wash., assignor to Rendell Tractor & Equipment Co., Ltd., Vancouver, Canada

Filed Oct. 7, 1970, Ser. No. 78,814
Int. Cl. B63h *25/42*
U.S. Cl. 115—35 25 Claims



1. A combination of a boat and a substantially vertical downwardly directed drive unit for said boat, said combination comprising:

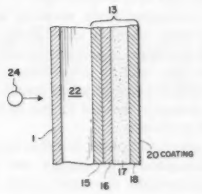
a. said boat having a bottom;
b. said boat having an opening in said bottom;
c. said drive unit fitting into said opening;
d. said drive unit comprising an input shaft;
e. a single downwardly directed drive shaft;
f. a propeller shaft;
g. a first driving means between said input shaft and said drive shaft;
h. a second driving means between said drive shaft and said propeller shaft;
i. a casing for said input shaft, said drive shaft and said propeller shaft;
j. said casing comprising a central housing for the upper part of said single drive shaft; said central housing extending below said bottom;
k. said casing comprising a vertical housing for the lower part of said single drive shaft;
l. two sets of lower tapered roller bearings;
m. the lower end of said single drive shaft being positioned in said tapered roller bearings of said drive shaft;
n. said lower tapered roller bearings being positioned with respect to the lower end of said vertical housing and inside of said vertical housing;
o. two sets of upper tapered roller bearings;
p. said two sets of upper tapered roller bearings being positioned between the upper part of said vertical housing and said central housing to allow relative rotation between said vertical housing and said central housing; at least one set of said two sets of upper tapered rollers bearings being positioned in said central housing below said bottom;
q. said input shaft being in said boat;
r. said drive shaft being in said boat and below the bottom of said boat; and,
s. said propeller shaft being outside said boat.

3,896,758

METEOROID IMPACT POSITION LOCATOR AIR FOR MANNED SPACE STATION

John D. Di Battista, Newport News, Va., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Oct. 2, 1973, Ser. No. 402,867
Int. Cl. G01d *21/00*; G01w *1/00*
U.S. Cl. 116—114 AH 6 Claims



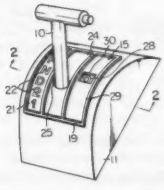
1. A method of locating meteoroid impacts in manned space vehicles which comprises the steps of: providing a space vehicle; coating the interior wall of the space vehicle with a layer of coating material of a preselected thickness having contrasting color to that of the vehicle interior wall said layer being of the preselected thickness so as to be capable of flaking or chipping off when an impacting meteoroid deforms said wall subjecting the space vehicle to meteoroid impact, and observing the vehicle interior wall for flaking or chipping thereby locating the point of meteoroid impact.

3,896,759

SHIFT LEVER POSITION INDICATOR FOR MOTOR VEHICLE AUTOMATIC TRANSMISSION SYSTEM

Hisateru Ogura, Yokohama, Japan, assignor to Nissan Motor Company Limited, Japan

Filed Apr. 26, 1974, Ser. No. 464,672
Claims priority, application Japan, May 31, 1973, 48-63361
Int. Cl. G09f *9/00*
U.S. Cl. 116—124 R 2 Claims



1. A shift lever position indicator for a motor vehicle automatic transmission system having a manual selector valve spool movable to different control positions, which comprises: a shift lever adapted to be connected to the manual selector valve spool so that the valve spool is positioned when said shift lever is placed at one of the control positions;

a casing including upper and bottom walls and having at the upper wall thereof a first central slot, and first and second elongated side windows extending along said first central slot and having at the bottom wall thereof a second central slot coextensive with said first central slot, said casing being so positioned as to allow said shift lever to be inserted into said first and second central slots and to be

movable along the longitudinal direction of said first and second central slots;

an opaque patterned plate member snugly fitted with said first elongated side window, said patterned plate member having first transparent patterned portions representing the respective control positions, said first transparent patterned portions being ordered along the moving direction of said shift lever;

guide means formed on said the inner surface of the bottom wall of said casing and extending along said second central slot;

a blind and slide member slidably mounted on said guide means and connected with said shift lever so that said blind and slide member slides along the direction of said shift lever in accordance with the movement of said shift lever, said blind and slide member having such an extent as to blind said first central slot;

an opaque indicating plate member connected with said blind and slide member and having second transparent patterned portions representing the respective control positions, said second transparent patterned portions being arranged beneath said second elongated side window in a direction inverse to that of said first transparent patterned portions;

an opaque apertured plate member snugly fitted with said second elongated side window and having an aperture having substantially the same extent as that of each second transparent patterned portion and formed at such a portion as to allow one of said second transparent patterned portions to be exposed outside of said casing;

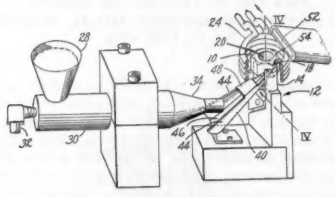
and at least one energizable light source positioned within said casing so that said light source irradiates light rays emitted from it when it is energized.

3,896,760

APPARATUS FOR MAKING SELF-LOCKING INTERNALLY THREADED ARTICLES

Richard J. Duffy, Salem, Mass., assignor to USM Corporation, Boston, Mass.

Division of Ser. No. 400,502, Sept. 25, 1973, which is a continuation-in-part of Ser. No. 314,854, Dec. 13, 1972, abandoned. This application Sept. 16, 1974, Ser. No. 506,576
Int. Cl.[2] B05B *7/00*
U.S. Cl. 118—308 **6 Claims**



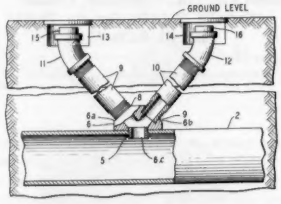
1. An apparatus for applying locking patches of normally hard, tough, resilient thermoplastic resin to internally threaded articles having openings at both ends of the threaded portion of the articles, comprising means for heating said articles to a temperature above the softening point of said resinous material, support means for holding said articles with the openings at the ends of the threaded portions substantially free, means providing a stream of fine particles of said resin entrained in a gaseous jet, guide means disposed to direct said jet and resin particles of said stream through a first opening of said threaded portion toward a selected area of the surface of said threaded portion and in a direction including a component toward the other of said openings for passage through said threaded portion and exit through said other opening and vacuum exhaust means adjacent said other opening in operative relation to draw air through said threaded portion to reduce deposition of resin particles in undesired areas of said articles and to draw off resin particles which have passed through said threaded portion.

3,896,761

ACCESS AND COUPLING APPARATUS FOR MACHINE COATING THE INTERIOR OF PIPES

Gerardo Di Mura, 459 Mountain Ter., Dunellen, N.J. 08812

Filed Oct. 2, 1974, Ser. No. 511,283
Int. Cl.[2] B05B *15/06*
U.S. Cl. 118—317 **8 Claims**



1. Apparatus for coupling a buried pipeline toward ground level for machine spray coating and the interior of the pipeline and its joints and without a need for an excavation to the pipeline after installation of the coupling apparatus and comprising

a base fixture fastenable to said pipeline, and

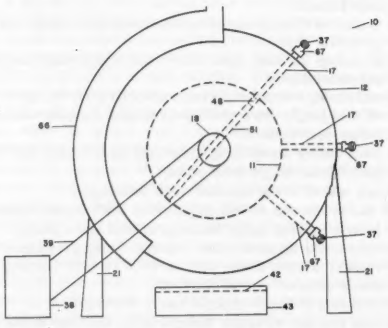
a pair of conduits secured to said base fixture and angularly disposed from one another for extending upward from said fixture toward ground level to enable a hose and spray nozzle to be sequentially admitted through each of said conduits and said base fixture in opposite upstream and downstream directions of said pipeline for spray coating operations.

3,896,762

COATING APPARATUS

Gilbert S. Banker, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 422,679, Dec. 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 316,037, Dec. 18, 1972, abandoned. This application June 17, 1974, Ser. No. 479,890
Int. Cl. B05c *3/10*
U.S. Cl. 118—30 **12 Claims**



7. A rotary coating apparatus comprising in combination, a frame, a vacuum drum rotatably mounted on the frame, end walls sealing the vacuum drum to the atmosphere, vacuum means communicating with the vacuum drum through one of the end walls, a plurality of rows of vacuum tubes in vacuum

sealed rotatable communication with the vacuum drum, the vacuum tubes being affixed to a plurality of interconnected gears, which gears are in engagement with a rotatable gear on the frame, whereby to effect the rotatable movement of the vacuum tubes, a vacuum shut-off means in slidable engagment with the inner surface of the vacuum drum, and means to move the shut-off means whereby to select either shut-off or establish vacuum communication between the vacuum drum and the vacuum tubes at a predetermined time during the apparatus rotation.

3,896,763

IMPREGNATING CORRUGATED CARDBOARD

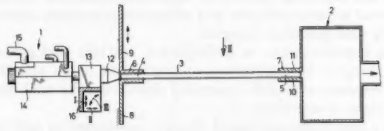
Günther Lau, Glogauerstr. 22, 8541 Katzwang; Edmund Bradatsch, Huttenwerkstr. 5, 8481 Weiherhammer; Hermann J. Brandl, Virchowstr. 33, 85 Nurnberg, and Georg Niggel, Rothenbachstr. 11, 8481 Weiherhammer, all of Germany

Filed Jan. 8, 1973, Ser. No. 321,840

Claims priority, application Germany, Jan. 14, 1972, 2201744

Int. Cl.[2] B05C *7/02*

U.S. Cl. 118—50 **3 Claims**



1. Apparatus for impregnating corrugated board including a serpentine fibrous intermediate layer, and a top and bottom planar fibrous outer layer having a predetermined height therebetween and cooperating with the serpentine layer to define a succession of transversely extending open-ended flutes having said predetermined height, comprising

a. means for longitudinally feeding said board with said flutes and said planar outer layers being arranged horizontally and with said flutes extending normal to the longitudinal direction of feed;

b. stationary impregnant supply means arranged adjacent one longitudinal edge of said longitudinally travelling board for supplying to one end of the flutes adjacent thereto an impregnating material, said impregnant supply means including

1. nozzle means for injecting a concentrated jet of said impregnating material, substantially devoid of air into said flutes, said concentrated jet having a height less than said predetermined height of said flutes, between said top and bottom layers

2. said nozzle means being provided with a bore hole and an exit aperture having a cross-section taken in a vertical plane through the bore hole which is substantially triangular when viewed perpendicular to the cross section, and a cross-section taken in a horizontal plane through the bore hole which is substantially semicircular when viewed perpendicular to the cross section;

c. said nozzle means and longitudinally feeding means being positioned such that said one longitudinal edge is positioned away from said nozzle means for allowing a gaseous medium entry to the flutes adjacent said nozzle means and concentrated jet as said concentrated jet is injected into said flutes for sheathing said jet as it enters said flutes, and

d. stationary suction means disposed adjacent the other longitudinal edge of said board opposite said impregnant supply means for establishing a vacuum in said flutes to draw the impregnating material in said jet and said surrounding gaseous medium therethrough.

3,896,764

EXTRUSION APPARATUS FOR COATING BOTH SURFACES OF TUBULAR MATERIAL

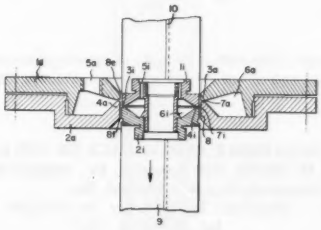
Erwin Kindl, Wiesbaden-Blebrich, and Gunter Gerick, Oberursol, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 193,524, Oct. 28, 1971, abandoned, which is a division of Ser. No. 100,916, Dec. 23, 1970, Pat. No. 3,709,720. This application July 18, 1973, Ser. No. 380,274

Claims priority, application Germany, Dec. 27, 1969, 1965130

Int. Cl. B05c *3/12*

U.S. Cl. 118—408 **4 Claims**



1. An apparatus for use in the continuous coating of a tube of fiber material with viscose which comprises a cylindrical passage having a width of about 0.3 to 1.0 mm, first annular slot die means having the slot thereof directed inwardly toward said cylindrical passage and in open communication therewith, second annular slot die means having the slot thereof directed outwardly toward said cylindrical passage and in open communication therewith, said first and second slot die means being offset from one another along said cylindrical passage such that a tube of fiber material conveyed through said cylindrical passage is coated with viscose, first on the exterior thereof and then on the interior thereof, first viscose feed means in open communication with said first slot die means and second viscose feed means in open communication with said second slot die means, the distance between the first and the second slot die means, the distance of said first slot die means from the entry opening of the cylindrical passage for the tube and the distance of said second slot die means from the exit opening of said cylindrical passage for said tube being not more than 50 mm.

3,896,765

APPARATUS FOR LIQUID-PHASE EPITAXIAL GROWTH

Kozo Ariga, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 6, 1972, Ser. No. 295,554

Claims priority, application Japan, Oct. 6, 1971, 46-79052; Dec. 10, 1971, 46-100523; Sept. 11, 1972, 47-91536

Int. Cl. B05c *3/18*

U.S. Cl. 118—412 **9 Claims**

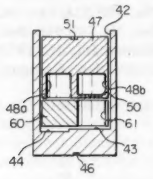
1. In an apparatus for liquid-phase epitaxial growth of a semiconductor, the improvement comprises:

An outer member having therein a cylindrical large bore opened at the upper end thereof and at least one substrate-carrying recess at the bottom wall of said large bore;

a cylindrical basic inner member snugly and slidably accommodated in said large bore and having at least two solution-containing bores at the lower end portion thereof excluding the central axis thereof, and opening toward said bottom wall of said large bore;

a cylindrical intermediate inner member accommodated in said large bore and interposed between said basic inner member and the bottom wall of said large bore, said intermediate inner member having a communication bore

extending from upper to lower ends for establishing communication between one of said two solution-containing bores and said substrate-carrying recess; and



a barrier plate with a plurality of openings mounted at the open end of one of said solution containing bores.

3,896,766

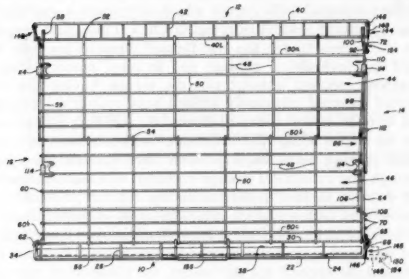
COLLAPSIBLE ANIMAL CAGE OR THE LIKE

Harlan W. Martin, Earl Township, Pa., assignor to Favorite Manufacturing, Inc., New Holland, Pa.

Filed Mar. 25, 1974, Ser. No. 454,266

Int. Cl.[2] A01K *1/02*

U.S. Cl. 119—17 **11 Claims**



8. A collapsible animal cage or the like comprising:

a rectangular floor structure having upwardly extending peripheral edge portions;

a litter tray or the like mounted on said floor structure in such a manner that its upper surface lies below the upper periphery of the side portions, said litter tray or the like being slidable through an opening in said peripheral edge portions of the floor structure;

a rectangular top structure;

front and rear rectangular end wall structures hingedly interconnected at their bottoms to the peripheral edge portion of the rectangular floor structure and swingable between an upright erected position wherein they are vertically disposed above the ends of the rectangular floor structure and a lowered collapsed position where they are horizontally disposed over the litter tray or like object;

right and left hand rectangular side structures hingedly interconnected at their top to said top structure and also hingedly interconnected at their bottom to the peripheral edge portions of said floor structure, each of said structures having horizontal hinge means between the top and bottom, said side structure being swingable between an upright erected position wherein they are vertically disposed above the side edges of the floor structure and a lower collapsed position wherein they are horizontally disposed in a folded position over said litter tray; and

means operable to hold said sides and ends in their erected position.

3,896,767

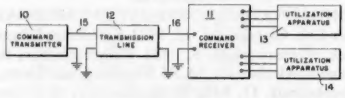
APPARATUS SELECTIVELY RESPONSIVE TO BILEVEL BIPOLAR PULSES

John T. Martin, Frederick, Md.; Robert E. Lay, Jr., Medway, Mass.; Edward L. Stene, Linthicum Hts., and Anthony J. Muscante, Baltimore, both of Md., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1964, Ser. No. 365,571

Int. Cl. F41g *7/02*; **F42b** *17/10*

U.S. Cl. 114—21 W **4 Claims**



1. In a wire guided torpedo system of the type comprising a torpedo, a remote command transmitter for generating low and high-pulse D.C. command signals, a guidance receptor carried by the torpedo and having a pair of input terminals, a transmission line comprising a guidance wire and seawater return for communicating said command signals to said terminals and imposing distortions upon said command signals as received at said terminals, and utilization apparatus controllable by said guidance receptor,

the improvements, in combination, wherein said guidance receptor is constructed and arranged to be selectively responsive to said command signals despite said distortions, comprising:

a. a first command signal channel connected to said input terminals and comprising a first relay, and a zener breakdown diode for effecting energization of said relay only upon reception of a high-pulse command signal;

b. a second command signal channel comprising a second relay, and means for effecting energization of said second relay upon reception of a low-pulse command signal;

c. said second command signal channel being connected to said input terminals through a normally closed switch controlled by said first relay; and

d. means for preventing operation of said second relay during pulse rise time of said high-pulse command signal.

3,896,768

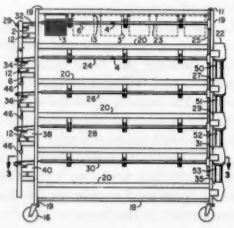
AUTOMATICALLY FLUSHING ANIMAL CAGE RACK

Charles H. Galloway, 2203 Franklin, Bryan, Tex. 77801

Filed June 5, 1974, Ser. No. 476,729

Int. Cl. A01k *1/00*, *31/04*

U.S. Cl. 119—22 **7 Claims**



1. An animal cage rack with flush system adapted to automatically clean animal waste from the vicinity of animal cages, comprising:

a plurality of supports for receiving animal cages, the cages constructed to permit waste to pass through the bottom of said cages;

a shelf situated beneath said cages for receiving animal waste;

a flush tank with bottom, side, front and back walls, said front wall disposed adjacent one end of said shelf, said tank being pivotally mounted at one end of said cage rack;

a piping system for delivering a suitable fluid to said tank, said piping system including a water inlet, lateral distribution pipes and an orificed valve for controlling the flow of said fluid to said tank;

a counterbalance attached to said tank for inhibiting pivotal motion of said tank; and

drinking valves situated on said lateral distribution pipes adjacent said cages for supplying continuously freshened water to the cages.

3,896,769

ANIMAL GROOMING DEVICE

Bobby L. McGehee, Seattle, Wash., assignor to Design Technology Corporation, Seattle, Wash.

Filed Sept. 7, 1973, Ser. No. 395,295

Int. Cl. A01k *1/04*

U.S. Cl. 119—122 **3 Claims**

1. An animal grooming device comprising:

a hollow, tubular, open-ended support;

clamping means secured to the lower end of the support for securing the grooming device to a horizontal support;

a grooming post having an upright portion and a laterally extending portion, with the upright portion telescoping into the hollow support;

clutch and collet means designed for one-hand operation for adjustment of the height of the grooming post, including (1) an annular clutch ring surrounding the grooming post where it telescopes into the housing threaded for vertical movement to the upper terminating end of the housing, the annular clutch ring including a flange at its upper end having an inner sidewall portion spaced away from the outer wall of the grooming post providing an annular space therebetween, (2) a bushing resting against the upper terminating end of the hollow support held in place by the clutch ring, and (3) a flexible, annular collet ring substantially filling the annular space held in place within the annular space by the clutch ring, the clutch ring, on turning in one direction, pressing the flange of the clutch ring against the collet ring, constricting and forcing the collet ring against the grooming post, preventing movement thereof, and, on turning of the clutch ring in the opposite direction, releasing the grooming post for vertical adjustment; and

damping means restricting the downward stroke of the grooming post boom on release of clutch and collet means for vertical adjustment.

3,896,770

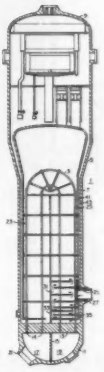
STEAM GENERATOR WITH SPLIT FLOW PREHEATER

Wilbur M. Byerley, and Robert R. Bennett, both of Tampa, Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 24, 1972, Ser. No. 274,698

Int. Cl. F22b *1/06*

U.S. Cl. 122—32 **2 Claims**



1. A vapor generator having a plurality of U-shaped tubes forming a tube bundle for providing the heat transfer service required to transfer heat from a first fluid to vaporize and superheat a second fluid, said tube bundle being so disposed within said vapor generator that the first fluid flows through the tubes creating a hot leg portion and a cold leg portion, said vapor generator comprising a tube sheet for receiving the ends of the tubes; a shell portion cooperatively associated with said tube sheet; a wrapper disposed within the shell portion and generally enclosing said tube bundle; a dividing plate cooperatively associated with said wrapper to form an evaporator enclosure incorporating at least a portion of the cold leg portion of the tube bundle and a vapor enclosure incorporating at least a portion of the hot leg portion of the tube bundle; a plurality of baffles disposed within said vapor enclosure causing the fluid flowing therethrough to follow a sinuous path over the outer surface of said portion of the hot leg; a preheater enclosing at least a portion of the cold leg portion of said tube bundle; a fluid inlet nozzle for the second fluid disposed in fluid communication with said preheater; and a fluid outlet nozzle for the second fluid disposed in fluid communication with the vapor enclosure, whereby the second fluid entering the preheater is heated to approximately saturation temperature, flows through the evaporator portion, wherein the second fluid is vaporized, and enters the vapor portion, wherein the vaporized fluid is superheated prior to being discharged through said second fluid outlet nozzle.

3,896,771

SPACER AND GUIDE ASSEMBLY FOR VERTICAL SUPERHEATER TUBES

Norman Chanine Chayes, Bloomfield, and Edward Leslie Kochey, Jr., Colebrook, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

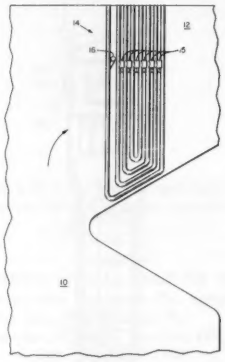
Filed Aug. 1, 1974, Ser. No. 493,795

Int. Cl.[2] F22B *37/24*

U.S. Cl. 122—510 **1 Claim**

1. In combination a plurality of spaced, vertical tubes, a spacer and guide assembly positioned between two of the vertical tubes, the spacer and guide assembly including a horizontal tube, guide lug means integral with one of the

vertical tubes, spacer lug means integral with the horizontal tube and coacting with the guide lug means so as to permit limited relative movement of the vertical and horizontal tubes, said guide lug means including a horizontal portion extending outwardly from the vertical tube, said spacer lug means being an inverted U-shaped lug fastened at the top to the bottom of the horizontal tube, the two legs of the U-shaped lug extending



downwardly on opposite sides of the horizontal portion of the guide lug means, a pair of spaced stop means secured to the horizontal portion of the guide lug means, one on either side of the legs of the U-shaped lug, the stop means being positioned such that they permit limited horizontal movement of the vertical tube relatively towards or away from the horizontal tube, but relative movement beyond this limit causes the U-shaped lug to contact one or the other of the stop means.

3,896,772

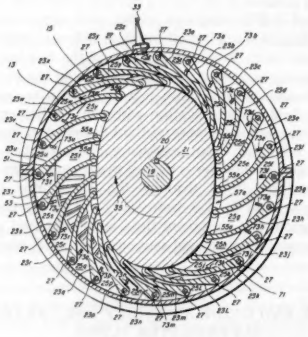
OVERLAPPING SWINGING PLATE INTERNAL COMBUSTION ENGINE

Samuel P. Lyle, 218 Spring St., Huntingdon, Tenn. 38344

Filed Aug. 24, 1973, Ser. No. 391,138

Int. Cl. F02b *53/00*

U.S. Cl. 123—8.47 **17 Claims**



1. In an internal combustion engine of the type having a stationary cylindrical case member provided with a circular chamber, intake manifold means for delivering fuel and air to said chamber, and a shaft disposed concentrically of said chamber and being journaled to said case member; the improvement which comprises hub means attached to said shaft, a plurality of overlappingly arranged plate means engaging said hub means and said case member for separating said chamber into a plurality of variable volume combustion cells, said plate means each being swingably attached to said case member establishing a free swinging end thereof; guide means for coupling each of said plate means to said hub means, for guidingly constraining said free swinging ends of said plate means, and for sequentially swinging said plate means as said shaft rotates; and means for providing internal combustion cycles of said combustion cells in rotational succession and for causing forces to be exerted respectively on said plurality of plate means to impart a continuous rotary force to said shaft; said shaft being straight, said hub means including an elliptical shaped portion which engages said plurality of plate means, said guide means being elliptical in shape, and said hub means being keyed to said straight shaft whereby rotation of said shaft is effective to cause said guide means to sequentially swing said plurality of plate means.

3,896,773

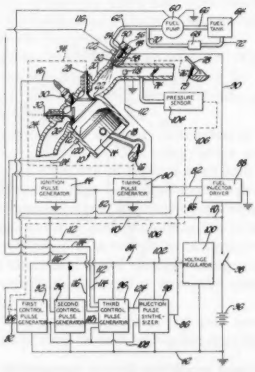
ELECTRONIC FUEL INJECTION SYSTEM

Lamonte R. Edison, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1972, Ser. No. 301,423

Int. Cl. F02b *3/00*

U.S. Cl. 123—32 EA **5 Claims**

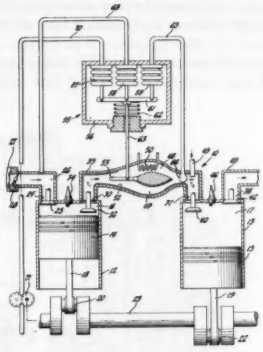


1. In an internal combustion engine, the combination comprising: means for defining a first time period initiated in synchronization with the operation of the engine and terminated at the expiration of a time duration determined as a preselected function of a first engine operating parameter; means for defining a second time period initiated in response to the initiation of the first time period and terminated before the termination of the first time period at the expiration of a time duration determined as a preselected function of a second engine operating parameter; means for defining a third time period initiated in response to termination of the second time period and terminated after the termination of the first time period at the expiration of a time duration determined by the time duration of the first time period less the time duration of the second time period and determined as a preselected function of a third engine operating parameter; and means for applying fuel to the engine in an amount directly related to a composite time period defined between the initiation of the first time period and the termination of the third time period so that the total quantity of fuel delivered to the engine is defined in relation to the preselected function of the first engine operating parameter by a linear fuel control curve having an offset determined by the preselected function of the second engine operating parameter and having a slope determined by the preselected function of the third engine operating parameter.

3,896,774
STAGED INTERNAL COMBUSTION ENGINE WITH MODULATING INTERSTAGE TEMPERATURE CONTROL

Robert M. Siewert, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 5, 1974, Ser. No. 485,940
Int. Cl. F02b *75/20*
U.S. Cl. 123—59 EC **4 Claims**



1. A staged combustion engine including means defining first and second stage expansible combustion chambers each having an inlet port and an exhaust port,

means connected with an output shaft to cyclically expand and contract said chambers and control said ports whereby to cause consecutive admission and combustion of combustible mixtures therein and subsequent exhaust of burned mixtures from said chambers, with a resultant delivery of power to said output shaft,

an inlet conduit connected with said first stage inlet port for supplying a rich combustible air-fuel mixture to said first stage combustion chamber,

an interstage conduit connecting the exhaust port of ssaid first stage chamber to the inlet port of said second stage chamber, said interstage conduit including a first gas flow path containing a heat exchanger and a second gas flow path connected in parallel with said first flow path and bypassing said heat exchanger,

valve means in said interstage conduit and movable between a first position blocking said first flow path and a second position blocking said second flow path to proportion the flow of interstage gas through and around said heat exchanger, and

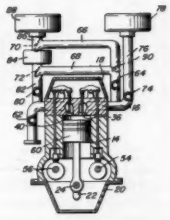
automatic control means connected with said valve means and responsive to at least one variable condition of engine operation to regulate the position of said valve means so as to control the flow of gases through and around said heat exchanger and thereby the temperature of the interstage gases supplied to said second stage combustion chamber in a predetermined manner with respect to said at least one engine operating condition.

3,896,775
SUPERCHARGED SIX-STROKE CYCLE COMBUSTION ENGINE

Raymond C. Melby, Box 395, Hinsdale, Mont. 59241

Filed Aug. 21, 1974, Ser. No. 499,350
Int. Cl.[2] F02B *75/02*
U.S. Cl. 123—64 **8 Claims**

1. In combination with an engine including a cylinder, a piston reciprocal in said cylinder, primary induction passage means including charge forming means operative to admit measured quantities of liquid fuel with air inducted through said primary induction passage means, primary exhaust passage means, secondary air induction passage means and secondary exhaust passage means, said engine further including means operative to (1) seal said cylinder from all of said passage means during a first stroke of said engine, (2) communicate said cylinder with said primary exhaust passage means during the second stroke of said piston, (3) communicate said

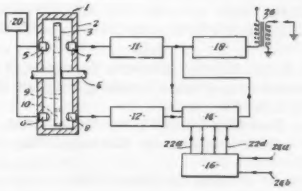


cylinder with said secondary induction passage means during the third stroke of said piston, (4) communicate said cylinder with said secondary exhaust passage means during the fourth stroke of said piston, (5) communicate said cylinder with said primary induction passage means during the fifth stroke of said piston and (6) seal said cylinder from all of said passage means during the sixth stroke of said piston, said secondary exhaust passage means including jet-type outlet means therefor opening into said primary induction passage means in a downstream direction.

3,896,776
IGNITION TIMING FOR INTERNAL COMBUSTION ENGINES

Eric Harold Ford, London, England, assignor to Lumenition Limited, London, England

Filed June 11, 1973, Ser. No. 368,622
Claims priority, application United Kingdom, Apr. 6, 1973, 16680/73
Int. Cl.[2] F02P *5/04*
U.S. Cl. 123—117 R **12 Claims**



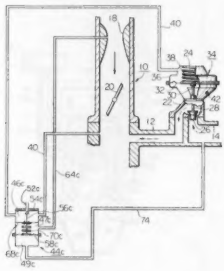
1. An electronic ignition system for an internal combustion engine including means for initiating a spark at a crank-shaft angle whose position between two given limits is determined at any instant in accordance with engine requirements and means for extinguishing the spark at the spark plug at a predetermined crank-shaft angle irrespective of the crank-shaft angle at which the spark is initiated.

3,896,777

EXHAUST GAS RECIRCULATION CONTROL DEVICE

Kenji Masaki, and Shuya Nambu, both of Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Aug. 27, 1973, Ser. No. 391,533
Claims priority, application Japan, Aug. 31, 1972, 47-86711
Int. Cl. F02m *25/06*
U.S. Cl. 123—119 A 1 Claim



1. In an exhaust gas recirculation system having a recirculation conduit to recirculate a portion of exhaust gases from the exhaust system of an internal combustion engine to the intake system thereof having a carburetor, a vacuum actuated exhaust gas flow metering valve normally closing the recirculation conduit; a diaphragm device operatively connected to the metering valve and a vacuum conduit connecting the spring loaded side of said diaphragm device to the intake manifold for actuation of the diaphragm device by the intake manifold vacuum to operate the metering valve, a modulating device comprising a casing interposed in and having a chamber forming part of said vacuum conduit, said chamber having an air bleed port opening to the atmosphere; an air bleed valve for closing said air bleed port; a spring loaded diaphragm having its spring loaded side connected to the venturi of the carburetor and the opposite side connected to the exhaust system, said spring loaded diaphragm being operatively connected to said air bleed valve such that said air bleed valve is urged toward such air bleed port to decrease air flow through said air bleed port as the magnitude of the venturi vacuum increases.

3,896,778

APPARATUS IN A COMBUSTION ENGINE INCLUDING A DEVICE FOR CONTINUALLY MEASURING AND INDIVIDUALLY DISTRIBUTING TO A PLURALITY OF FUEL INJECTION VALVES THE AMOUNTS OF FUEL APPROPRIATE TO THE AMOUNTS OF COMBUSTION AIR

Johannes Zeyns, Krauler Elbdeich, Pappelhof, 2 Hamburg-Kirchwerder-4, and Heinz Enneking, Hegholt 32, 2 Hamburg 71, both of Germany

Filed May 11, 1973, Ser. No. 359,445
Claims priority, application Germany, May 15, 1972, 2223593
Int. Cl. F02m *39/00*
U.S. Cl. 123—139 AW 31 Claims

1. In combustion engines having a plurality of working cylinders, an air intake channel and a plurality of injection valves associated therewith, an apparatus comprising:

a. a device arranged in the air intake channel to be exposed to the flow of combustion air for continually measuring the amounts of combustion air drawn in and for continually measuring and individually distributing to the plurality of injection valves the amounts of fuel appropriate to the amounts of combustion air;

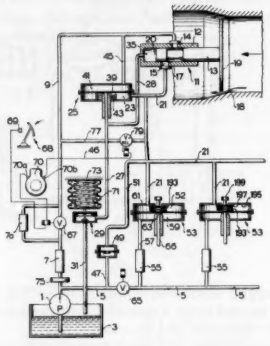
b. a fuel tank;

c. a fuel control pipe connected between said fuel tank and said device, said fuel control pipe having an opening, the flow cross section of said opening being altered by said device proportionally to the amount of air flowing in the air intake channel;

d. a fuel pump for delivering fuel through said fuel control pipe to said device;

e. an amplifying resistance connected within the flow path defined by said fuel control pipe with a control pressure being built up in said fuel control pipe downstream of said amplifying resistance by the alteration of said opening, thus bringing about a controlled flow of fuel to said device;

f. a differential pressure regulator connected to said fuel control pipe, said device and said fuel tank;



g. a plurality of parallel-connected metering regulators each including a membrane and an adjustable additional force-exerting member on one side of said membrane, said metering regulators being connected to said device and said fuel control pipe, wherein a reduced control pressure is abstracted downstream of said opening which acts as a common force on one side of each of said membranes, said reduced control pressure being supplemented by said forceexerting members; and

h. a plurality of metering resistances, one for each of said metering regulators, each said metering resistance being connected to its respective metering regulator to the other side of the membrane of that metering regulator and to said fuel control pipe, said other side of each metering regulator being subjected to pressure by fuel which is fed thereto by said fuel pump and through a respective metering resistance, said fuel passing from this side of said membranes downstream of the metering regulators for injection.

3,896,779

FUEL INJECTION PUMP FOR AN INTERNAL COMBUSTION ENGINE

Norio Omori, Kariya, and Katsuhiko Oiwa, Handa, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

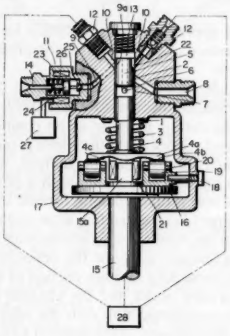
Filed Mar. 20, 1973, Ser. No. 342,983
Claims priority, application Japan, Mar. 30, 1972, 47-32021
Int. Cl. F02m *63/02*
U.S. Cl. 123—139 E 2 Claims

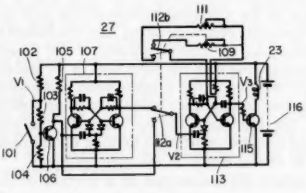
1. A fuel injection pump for an internal combustion engine having a cylinder provided with a suction passage and a suction port, a piston rotatably and reciprocally received in the cylinder, a compression chamber enclosed by the cylinder and the piston, and the suction port being open during the suction stroke to the compression chamber and being closed during

the compression and injection stroke of the piston, the improvement comprising:

an electromagnetic valve installed in said suction passage leading to the suction port for controlling the fuel supply into the compression chamber, and

a controller connected to said valve for controlling said valve to open during idling operation of the engine at a lower frequency than that in ordinary operation and for a longer period of time to supply enough fuel to keep the temperature of the combustion chamber high to thereby decrease the stimulus odor of the exhaust gas, said controller including means for generating a signal corresponding to a suitable fuel injection time for each cylinder of the engine in accordance with the engine revolution, a flip-flop circuit connected to said signal generating





means for dividing the frequency of said generated signal by one-half, a monostable multivibrator connected to said valve for controlling the energization of said valve, a variable resistor connected to said multivibrator for varying the output pulse width of said multivibrator in accordance with the position of the accelerator, a second variable resistor connected to said multivibrator for varying the output pulse width of said multivibrator by manual operation, a switch for connecting said generating means to said multivibrator directly in ordinary operation of the engine and through said flip-flop circuit in idling operation thereof, and a second switch for connecting said multivibrator to said variable resistor in ordinary operation of the engine and to said second variable resistor in idling operation of the engine.

3,896,780

BREAKERLESS IGNITION SYSTEM FOR A MULTICYLINDER INTERNAL COMBUSTION ENGINE

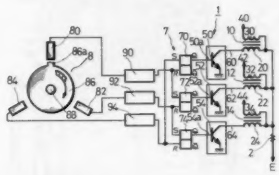
Tetsuya Kondo, Numazu, Japan, assignor to Kokusan Denki Co., Ltd., Numazu, Japan

Filed Apr. 3, 1974, Ser. No. 457,600

Claims priority, application Japan, Apr. 5, 1973, 48-40536[U]

Int. Cl.[2] F02P *3/02*

U.S. Cl. 123—148 E **4 Claims**



1. A breakless ignition system for a multicylinder internal combustion engine comprising a plurality of ignition circuits each including an ignition coil and solid state switching means to control said ignition coil so as to allow a primary current to flow through said ignition coil and to cut off said primary current so that a high voltage is established across said ignition coil and a control circuit to control each of said solid state switching means of said ignition circuits, said control circuit associated with a signal generator rotating in time with a multicylinder internal combustion engine for generating signals to operate said control circuit, the improvement wherein said control circuit comprises a corresponding number of flip-flop circuits to that of said ignition circuits, said flip-flop circuits each having one of the output terminals connected to the control terminal of the corresponding solid state switching means so that it interrupts said solid state switching means with one of the adjacent flip-flop circuits signaling the other flip-flop circuit to cause conduction of the corresponding solid state switching means with said other flip-flop circuit when said one flip-flop circuit interrupts the corresponding solid state switching means, said signal generator including a corresponding number of signal coils to that of said ignition circuits, which control said flip-flop circuits.

3,896,781

DUAL ROTARY VALVED INTERNAL COMBUSTION ENGINE

George O. Smith, Ferndale, Mich., assignor to General Motors Corporation, Detroit, Mich.

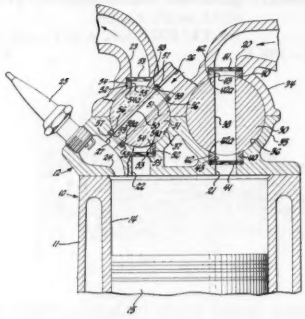
Filed July 10, 1974, Ser. No. 487,139

Int. Cl. F01l *7/00*

U.S. Cl. 123—190 BD **4 Claims**

1. In an internal combustion engine, a housing means having at least one cylinder arrangement therein comrpising a combustion chamber and a pre-combustion chamber in communication with said combustion chamber, said housing means having a first fuel and air supply passage means extending to said combustion chamber, a second fuel and air supply passage means extending to said pre-combustion chamber, and an exhaust passage means extending to said combustion chamber, a first valve shaft rotatably journalled in said housing in position to intersect said first fuel supply passage means whereby to control the flow of fluid therethrough and having at least one radial extending passage therethrough axially positioned therein for alignment with said first fuel supply passage means, a second valve shaft rotatively journalled in said housing means in position to intersect said second fuel supply passage means and said exhaust passage means, said second shaft having a radially extending first passage therethrough and a radially extending second passage therethrough axially spaced from said first radially extending passage, said

first passage being positioned for alignment with said second fuel supply passage means and said second passage being positioned for alignment with said exhaust passage means and,



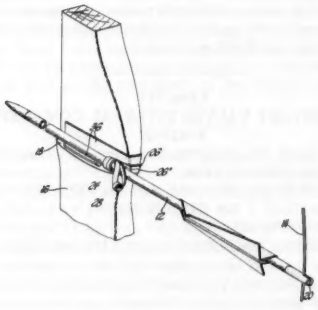
drive means operatively connected to said first valve shaft and to said second valve shaft to effect synchronous rotation of said first valve shaft relative to said second valve shaft in timed relation to the operation of said engine.

3,896,782

ARROW HOLDER

Richard F. Carella, 35572 Strathcona, Mt. Clemens, Mich. 48043

Filed Oct. 30, 1973, Ser. No. 411,045
Int. Cl. F41b *5/00*
U.S. Cl. 124—41 A **13 Claims**



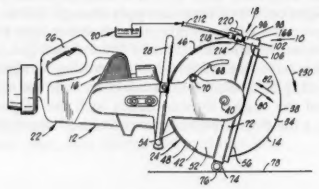
1. An archery assembly for holding an arrow in a nocked position on a bowstring of a bow and comprising; support means for gripping an arrow and adapted for attachment to a bow, said support means including arrow gripping means having an exposed elastic surfact strip stretched while being wrapped around an arrow in overlapping convolutions engaging itself as an arrow is in a nocked position and to grip an arrow in the overlapping convolutions as an arrow is allowed to move forward and to release an arrow upon rearward longitudinal movement of an arrow, said support means further including means connected to said arrow gripping means and adapted to be secured to the handle area of a bow.

3,896,783

CUTTING APPARATUS FOR CUTTING CONCRETE MATERIAL AND THE LIKE

Artie L. Manning, 3740 N.W. 26, Oklahoma City, Okla.

Filed May 23, 1973, Ser. No. 362,892
Int. Cl. B28d *1/04*
U.S. Cl. 125—13 R **10 Claims**



1. A cutting appratus, having a portion for applying a fluid from a fluid source in one position, comprising:

frame means;

a cutting blade supportedly connected to the frame means; drive means connected to the cutting blade drivingly moving the cutting blade in an on position thereof;

a support head connected to the frame means, having a fluid port formed through portion thereof, the fluid port including a channel formed through a portion of the support head and a tube opening formed through a portion of the support head extending at an angle to the channel, one end of the tube opening intersecting the support head forming a fastener inlet and the opposite end of the tube opening intersecting another portion of the support head forming a tube outlet and the channel intersecting and fluidically communicating with the tube opening, a stop surface being formed in the support head and positioned within a portion of the tube opening;

a hollow tube removably disposed and supported within a portion of the tube opening in the support head having an extended portion extending a distance from the support head and disposed near the cutting blade in an assembled position of the tube, a fluid opening formed through a portion of the extended portion of the tube intersecting and fluidically communicating with the hollow portion of the tube and the hollow portion of the tube fluidically communicating with the fluid port in an assembled position of the tube in the support head, a tube stop surface and an engaging surface being formed on a portion of the tube, the tube stop surface engaging the stop surface formed in the support head limiting the movement of the tube in one direction in the tube opening;

means removably connected to a portion of the support head having a portion engaging a portion of the tube limiting the movement of the tube in a directions, opposite the direction limited via the stop surface in the support head and securing the tube in an assembled position in the support head, said means comprising:

a plug removably disposed through the fastener inlet in the support head having a stop surface formed on a portion thereof and a plug opening formed therein, the stop surface formed on the plug engaging the engaging surface of the tube and securing the tube in an assembled position, the plug opening fluidically communicating with the hollow portion of the tube and fluidically communicating with the channel in the support head for providing fluidic communication between the channel in the support head and the hollow portion of the tube via the plug opening in an assembled position; and

means connecting the support head and the fluid source establishing fluidic communication between the fluid source and the channel, the fluid source being in fluidic communication with the fluid opening in the tube via the fluid port in one position, the fluid from the fluid source being applied to the cutting blade via the fluid opening.

3,896,784
CAMPING STOVE

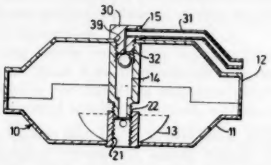
Allan Baxter, Bromley, England, assignor to Allanter Instruments Limited, Bromley, England

Filed Aug. 14, 1973, Ser. No. 388,166

Claims priority, application United Kingdom, Aug. 23, 1972, 39162/72; Sept. 21, 1972, 43663/72; Dec. 19, 1972, 58530/72

Int. Cl. F24c *5/20*

U.S. Cl. 126—38 **13 Claims**



1. A camping stove comprising, in combination:
a. a pan support;
b. a base member having an aperture;
c. a burner unit attached to said pan support;
d. an air/gas mixture tube;
e. a gas jet fitment extending through said base member aperture;
f. first co-operating connection means on said air/gas mixture tube and said gas jet fitment clamping said base member between said air/gas mixture tube and gas jet fitment and enabling said mixture tube and said gas jet fitment to be connected together; and
g. second co-operating connection means on said air/gas mixture tube and said burner unit enabling said mixture tube and said burner unit to be connected together in alternatively arrangeable conditions of said stove parts in which in an assembled condition, said burner unit and said pan support are mounted by said air/gas mixture tube on said base member for supporting and heating an article to be heated, and, in a demounted condition said pan support and said base member together form a closed casing for containing and protecting from damage said gas jet fitment, said air/gas mixture tube and said burner unit, said first and second co-operating connection means enabling said gas jet fitment, said mixture tube and said burner unit to be interconnected with each other and the casing when the stove is demounted to prevent said gas jet fitment and said mixture tube from being displaceable from within the casing.

3,896,785
FIREPLACE HEATING CHANNEL

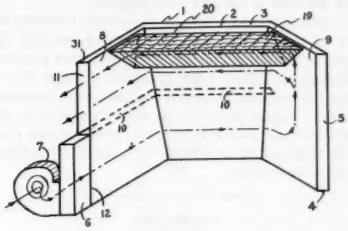
Clifford H. Nelson, 9 Merry Point Ter., Newport News, Va. 23606

Filed Jan. 21, 1974, Ser. No. 434,978

Int. Cl. F24b *7/00*

U.S. Cl. 126—121 **7 Claims**

1. A free standing fireplace heating channel comprising a hollow metal air conveying channel in combination with a flame guide vane, insertible into an existing conventional fireplace without requiring modification to the fireplace structure, said channel having a center panel and at least one forward facing channel arm adapted to fit against multiple inside walls of a fireplace, said air channel having adjoining walls exposed to the heat from the fire with corresponding rear walls spaced therefrom and connected by spacer means so as to form a suitable air channel for conveying room air to be heated by the fire, means for forcing room air into a lower portion of said forward facing channel arm by a single blower, and baffle means to direct the forced circulating room air to make multiple horizontal passes through said channel prior to exiting back into a room from an upper portion of a forward facing channel arm as useful heating air, said guide vane being attached to an upper inside portion of said forward facing arm of said air channel and extending horizontally to a symmetrical position on an opposite side, said hollow metal guide vane having a triangular cross section with the base horizontal and the apex pointing downward toward the fire and positioned forward of the center panel of the air channel so as to form an upward converging passageway for the hot fire gases, said



passageway being formed by the upper portion of a near vertical surface of the center panel and the opposing rearward slanting surface of the guide vane wherein the width of the horizontal base of the guide vane is constructed wide enough to almost block the remainder of the fireplace throat leaving only a small gap between the forward facing edge of the vane and the inside front surface of the fireplace throat, and insulation means for reducing heat losses from the horizontal base of said vane.

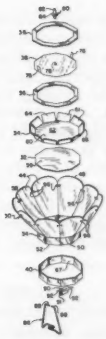
3,896,786
SOLAR STOVE

Merton L. Clevett, Englewood, Calif., assignor to Solar Products Corporation, Denver, Colo.

Filed May 29, 1973, Ser. No. 364,366

Int. Cl. F24j *3/02*

U.S. Cl. 126—270 **9 Claims**



1. A solar stove apparatus comprising in combination:
a plurality of identical solar-reflective panel means, each of said panel means being generally in the form of a concave petaloid,
a base assembly having an open topped box-like oven portion, said solar-reflective panel means including common inner portions adapted to be seated in said base assembly and outer portions pivotally attached to the oven portion

for movement between a folded position overlying the top of the oven portion in stacked relationship with each other and an unfolded position in which said panel means radiate outwardly from the open top of the oven portion each petaloid being concave in the direction of radiation away from said open top,

a retention band of non conductive material defining a ring tightly fitting and conforming to the outside of the inner portions of the said reflective panel means,

attachment means releasably attaching the said solar-reflecting panel means in edge-to-edge relationship to one another in the unfolded position,

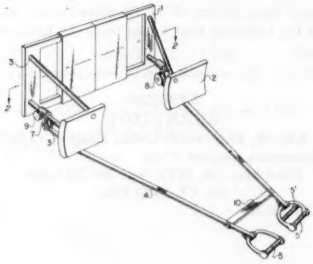
a transparent window element removably covering the open top of the oven portion to selectively enclose the oven portion, said panel means in the unfolded position being adapted to reflect solar radiation through the window element and into the oven portion of the apparatus, and support means operative to support said base assembly such that said base assembly can be selectively positioned and retained in a desired directional orientation with respect to the sun.

3,896,787

THERAPEUTIC APPARATUS

Ronald L. Withers, 6710 Harwood Pl., Springfield, Va. 22152

Filed Dec. 18, 1973, Ser. No. 425,929
Int. Cl. A61b *19/00*
U.S. Cl. 128—1 R **9 Claims**



1. An apparatus for therapeutically assisting the conjugal relationship between a man and woman which comprises a supporting framework and shoulder stops, structural means connected to said supporting framework and said shoulder stops for extending the shoulder stops a distance from the supporting framework, straps extending from said structural means, said straps being provided with foot-engageable stirrups, adjusting means associated with said structural means for changing the length of the straps, said adjusting means comprising spool means which are adapted to receive or discharge the straps and hand-operated knob means operatively associated with the spool means for winding the straps thereon or unwinding the straps therefrom.

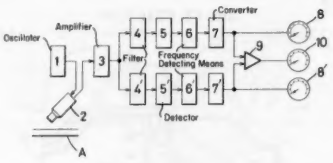
3,896,788

DOPPLER EFFECT BLOOD FLOW METER

Yutaka Sato, Nara, Japan, assignor to Hitachi Medical Corporation, Tokyo, Japan

Filed Dec. 28, 1973, Ser. No. 429,293
Claims priority, application Japan, Jan. 22, 1973, 48-10671
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 F **5 Claims**

1. An improved Doppler effect blood flow meter for determining velocity and blood flow direction comprising a high frequency oscillator which generates a high frequency signal, a probe means coupled to said high frequency oscillator for transmitting the high frequency signal toward blood vessels and for receiving said high frequency signal after reflection thereof by blood corpuscles, said received signal being Doppler shifted in frequency, two filter means operatively coupled in parallel to said probe means, said filter means having sharp filtering characteristics capable, respectively, of dividing the high frequency waves reflected from blood corpuscles into frequency ranges above and below the frequency of said transmitted signal, indicative of blood flow toward and away from said probe means, means operatively coupled to each said filter means for producing an output wave indicative of the frequency of the received signal, and output means coupled to said output wave producing means for indicating the velocity and direction of blood flow.



3,896,789

RETINOIC ACID DIPENSING PRESSURE SENSITIVE DERMOTOLOGICAL TAPE

Ronald J. Trancik, White Bear Lake, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed June 10, 1974, Ser. No. 477,689
Int. Cl. C09j *7/02*; **A61f** *7/02*
U.S. Cl. 128—2 R **8 Claims**

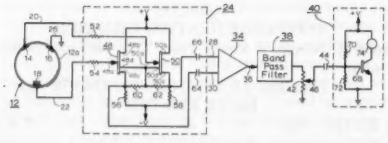
1. A pressure-sensitive adhesive tape defining a means for applying a dermatological substance comprising a backing member with a layer of pressure-sensitive adhesive attached thereto, and a pharmacentically effective and stable concentration of retinoic acid and retinoic acid stabilizer homogeneously contained in said pressure-sensitive adhesive layer, said adhesive being dermatologically compatable and being compatable and substantially non-reactive to said retinoic acid and retinoic acid stabilizer.

3,896,790

ALPHA BRAIN WAVE SENSOR

Ned Dikmen, Chicago, Ill., assignor to Neuronics, Incorporated, Chicago, Ill.

Filed May 1, 1972, Ser. No. 249,166
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.1 B **1 Claim**



1. An alpha brain wave sensor including an electrode system and adapted to be operative independently of an electrode cream for developing an audible reproduction of alpha frequency brain waves from a human subject, comprising:

electrode means for effecting electrical contact with a human subject independently of an electrode cream including a reference electrode adapted for positioning in direct contact with the forehead of said subject, a signal electrode comprising an electrically conductive, non-apertured electrode base plate means and a plurality of electrically conductive rod members on the order of one-half inch in length disposed in spaced parallel relation and

each having one blunt end portion adapted for extending through the hair of said subject to effect electrical non-penetrating contact with the scalp in the region above the occipital lobes and an opposite end portion affixed to said electrode base and a ground electrode adapted to be coupled to said subject, said reference and ground electrodes comprising planar metal discs,

said base plate means, comprising a rigid, non-apertured, planar metal disc fixedly secured to said opposite end portion of each of said rod members with said rod members for electrically interconnecting and for physically supporting said rod members in a predetermined spaced relation relative to one another to permit free hair flow intermediate the prongs,

signal amplifying means comprising a pair of impedance matched field effect type transistors having individual inputs coupled to said reference and signal electrodes by respective electrical signal conductors, with each of said transistors having an input impedance substantially greater than the surface contact resistance between said reference and signal electrodes and said subject and further having individual outputs, and a differential type transistor amplifier coupled to said individual outputs for developing an amplified difference of said signal outputs of said field effect transistors;

band pass filter means included within said amplifying means for attenuating signals outside of the eight to thirteen cycle per second alpha frequency range;

sound developing means coupled to said amplifying means for converting the alpha frequency signals developed by said amplifying means and said band pass filter means into audible sounds, said sound developing means comprising an oscillator having a natural oscillation frequency within the lower portion of the audible range,

said amplifying means being coupled to said sound developing means through a potentiometer for permitting manual adjustment of the threshold sensitivity level of said sound developing means,

said electrode means including a support band for fitting about the head of said subject and carrying said reference and ground electrodes thereon in spaced relation for contact with the forehead of said subject and further carrying said signal electrode, spaced relative to reference and ground electrodes, for contact with the scalp in the region above the occipital lobes,

said support band having aperture means therein, said reference electrode, ground electrode and signal electrode having conductor means associated therewith and extending in said aperture means in said support band.

3,896,791

ELECTRONIC BLOOD PRESSURE METERS

Kazuaki Ono, Tokyo, Japan, assignor to Seiwa Me Laboratories, Inc., Osaka, Japan

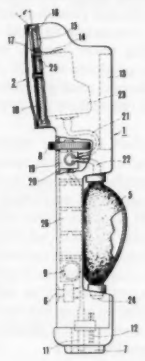
Filed Nov. 21, 1973, Ser. No. 417,962

Claims priority, application Japan, Nov. 27, 1972, 47-135393; Apr. 24, 1973, 48-49090

Int. Cl. A61b *5/02*

U.S. Cl. 2.05 G **10 Claims**

1. In a portable hand held electronic blood pressure meter of the class wherein air is admitted into an inflatable bag of an arm band from an air bulb and the blood pressure measured with the assistance of a microphone carried by the arm band and displayed by a blood pressure meter, the improvement which comprises an elongated hollow casing capable of being held in the hand of a human being, a blood pressure meter having a calibrated scale mounted on one end of said casing, an air pressurizing bulb connected to said blood pressure meter secured on one side of said casing and capable of being hand actuated by a holder of the casing, an arm band including an inflatable bag and a microphone secured to said inflatable bag, a connecting pipe including an integral air supply pipe interconnecting said air bulb and said inflatable bag, electric circuit means for amplifying electric signals produced by said microphone, light means for lighting the calibrated scale of said blood pressure meter and energized by said electric circuit means, and an electric cable interconnecting said



microphone and said electric circuit means, said electric circuit means synchronously illuminating the calibrated scale of said blood pressure meter instantaneously with the occurrence of the blood pulses being measured.

3,896,792

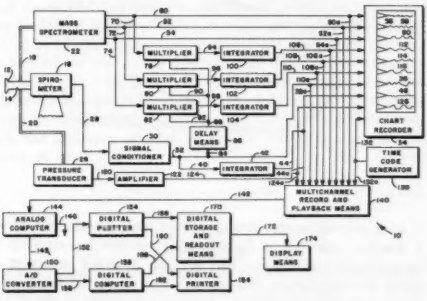
REAL-TIME CYCLIC PULMONARY FUNCTION TEST SYSTEM

Edwin G. Vail, Lynn Haven; Maxwell W. Lippitt, Jr., Panama City, and Phillip D. Seymour, Lynn Haven, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 15, 1974, Ser. No. 470,255

Int. Cl. A61b *5/08*

U.S. Cl. 128—2.07 **3 Claims**



1. A pulmonary function testing system comprising in combination:

valveless conduit means adapted to conduct respiratory gases to and from a subject during pulmonary maneuvers;

valveless spirometer means, connected to said conduit means, for generating first analog signals representative of flow rates of said respiratory gases;

mass spectrometer means, connected to said conduit means, for generating second analog signals representative of partial pressures of constituents of said respiratory gases, said second analog signals being characterized by being out of phase in time a predetermined amount relative to corresponding occurrences of flow rate fluctuations in said respiratory gases;

pressure transducer means, connected to said conduit means, for generating third analog signals representative of oral pressures in said respiratory gases;

time delay means, connected to receive said first analog signals, for providing delayed first analog signals that are retarded in time by said predetermined amount;

multiplier means, connected to said mass spectrometer means and to said delay means, for providing fourth analog signals as products of said delayed first analog signals and said second analog signals and representative of volumes of said respiratory gas constituents per breath; and

multiple channel chart recorder means, coupled to said spirometer means, to said mass spectrometer means, to said pressure transducer means and to said multiplier means, for concurrently providing individual graphic traces of said first, second, third, and fourth analog signals with reference to time, whereby the simultaneous effects of physiological events on said flow rates, said oral pressures, said partial pressures, and said volumes of said respiratory gases are depicted in substantially real time and with time parity existing between traces of said flow rate fluctuations and of said partial pressures of constituents of said respiratory gases.

3,896,793

ENDOSCOPE WITH VIEW FIELD ALTERING MEANS

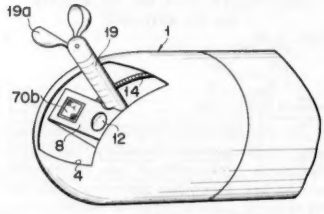
Kazuhiko Mitsui, and Katsuyuki Kanehira, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed June 17, 1974, Ser. No. 479,992

Claims priority, application Japan, June 19, 1973, 48-69007; June 19, 1973, 48-69008

Int. Cl.[2] A61B *1/06*

U.S. Cl. 128—6 **7 Claims**



1. In an endoscope having a distal end section formed with a window opening, a flexible tube section having one end connected to said distal end section in order to insert and guide the end section into the body cavity of a human being, and a control unit connected to the other end of the flexible tube section, said endoscope comprising a flexible fiber bundle disposed lengthwise within the distal end section and the flexible tube section in a manner extending thereover and having a forward end portion extended up to the window opening of the distal end section and an end plane formed in said forward end portion for allowing light to pass therethrough, said end plane being directed to a view field of the body cavity through the window opening; a movable member mounted onto the forward end portion of said fiber bundle; and movable member actuating means having one end connected to said movable member for moving the movable member within the distal end section upon operation thereof at the control unit thereby to direct the end plane of the forward end portion of the fiber bundle to a different view field of the body cavity.

3,896,794

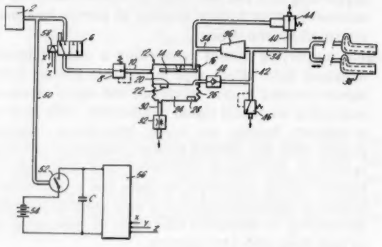
VENOUS FLOW STIMULATOR

John Alan McGrath, Harlow, England, assignor to The British Oxygen Company Limited, London, England

Filed Dec. 14, 1973, Ser. No. 424,813

Int. Cl. A61h *1/00*

U.S. Cl. 128—24 R **12 Claims**



1. An apparatus useable in conjunction with a source or pressurized gas for stimulating venous blood flow in the legs of patients undergoing surgery, said apparatus including at least one double-walled pneumatic boot positioned on and completely enclosing a patient's leg and foot; said boot having an operating space defined between the walls thereof; a supply valve operative to control the supply of gas at a suitable pressure from a pressurized source to the operating space; means responsive to the gas pressure in the operating space for closing the supply valve when the pressure reaches a chosen maximum valve; a timer means adapted to produce a series of successive set and reset pulses, and an inlet valve means, controlled by the timer, for supplying gas to the supply valve upon receipt of a set pulse, and for discontinuing the supply of gas upon receipt of a reset pulse.

3,896,795

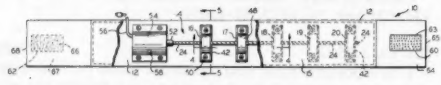
VIBRATOR BELT

Nariman Solhkhah, 2320 W. Pratt Ave., Chicago, Ill. 60645

Filed Feb. 21, 1974, Ser. No. 444,520

Int. Cl. A61h *1/00*

U.S. Cl. 128—32 **15 Claims**



1. A vibrator belt comprising:

a belt for positioning around a part of the body;

a plurality of spaced apart movable means secured to the belt;

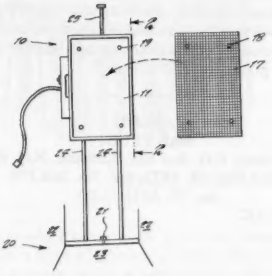
means for securing each of the movable means at a fixed location on the belt; and

a shaft associated with said movable means whereby the revolving of said shaft causes movement of said movable means.

3,896,796
BACK VIBRATOR AND WASHER

Daniel W. Soderblom, 205 N. Locke, Farmington, N. Mex. 87401

Filed July 26, 1973, Ser. No. 382,665
Int. Cl. A61h 1/00
U.S. Cl. 128—36 4 Claims



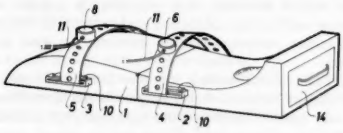
1. In a back vibrator and washer, the combination of a base panel, a pad upon the front side of said base panel, and said base panel incorporating a plurality of vibrator motors for developing a vibrating motion;

Said base panel having a plurality of openings extending from a side edge thereof, each one of said openings extending into a center of said base panel, and each one of said openings receiving a vibrator motor, said vibrator motor being connected by a water-proof wiring to a switch and an electric source.

3,896,797
APPARATUS FOR MECHANICAL STIMULATION OF THE HEART

Ionel Bucur, Lund, Sweden, assignor to Bengt O. Petersson, Hisings Backa, Sweden

Filed Apr. 8, 1974, Ser. No. 458,789
Claims priority, application Sweden, Apr. 10, 1973, 7305030
Int. Cl.[2] A61H 7/00
U.S. Cl. 128—53 6 Claims



1. Apparatus for mechanical stimulating of the heart comprising a girdle provided to be stretched over the chest of a human body and carrying power means arranged to mechanically treat said chest in a rhythmical sequence thereby stimulating the heart in said body, which apparatus comprises a further girdle provided to be stretched over the body in the level of the abdomen and provided with means arranged to be extended thereby exerting a thrust against the abdomen intended to cause a compression of aorta abdominalis of the body.

3,896,798
THERAPEUTIC TRACTION APPARATUS

Peter J. Simon, 1065 Talbot St. North, London, Ontario, Canada

Filed June 11, 1973, Ser. No. 368,759
Int. Cl. A61h 1/02
U.S. Cl. 128—75 2 Claims

FIG 1

1. Apparatus to provide traction to the spine of the body of a user comprising a first and second pair of spaced apart upwardly extending members secured in fixed relationship, first spring means individual to said first pair, second spring means individual to said second pair, a pair of horizontally disposed spaced apart bars, at least one bolster means providing a padding to each horizontal bar intermediate of its length, each horizontal bar being supported at a corresponding one end by one of said first spring means with the other end supported by one of said second spring means at a height whereby the feet of the body of a user will clear the ground when the body of a user is supported by the user's arms located on said bolster means, the ratio of the strength of the said first spring means to the strength of said second spring means increasing with the distance of said bolster means from said second spring means.

3,896,799
ARM BOARD

Wayne C. Seeley, 238 Pleasant Acres Rd., York, Pa. 17402

Filed June 10, 1974, Ser. No. 477,635
Int. Cl. A61f 5/04
U.S. Cl. 128—87 R 8 Claims

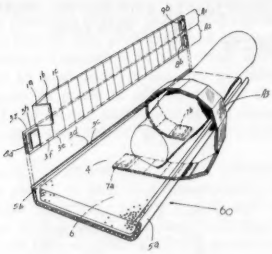
1. An arm board having an arm supporting surface; a cushion affixed to said supporting surface; and depending flexible side walls extending away from said arm supporting surface, said side walls each comprising at least a front section and a rear section separated by a substantially vertical slot, a portion of said side walls being capable of outward movement whereby the front and rear sections of each wall may move different distances laterally.

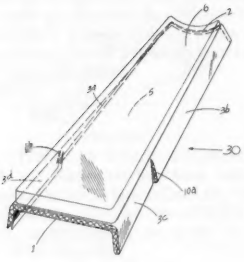
4. A device for supporting an arm or other limb comprising:

a. a main body portion having opposing side walls;

b. one of said side walls being a one-piece integrally formed extension and having a detachable section comprising detachable strap means including cooperating fastening

means thereon; said detachable strap means being detachable and sufficiently flexible to be wrapped around





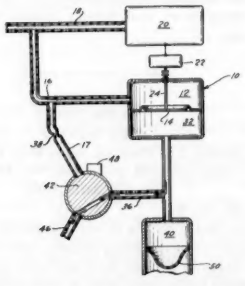
the arm or limb to secure the same to the main body portion.

3,896,800

METHOD AND APPARATUS FOR TRIGGERING THE INSPIRATORY PHASE OF A RESPIRATOR

Anthony B. Cibulka, Poynette, Wis., assignor to Airco, Inc., Montvale, N.J.

Filed July 27, 1973, Ser. No. 383,422
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—145.8 **13 Claims**



8. In a respirator for supplying gas to a patient and having inspiratory and expiratory phases, the respirator being adapted to retain a predetermined positive gas pressure within the patient at the end of the expiratory phase and having switching means to switch the respirator from the expiratory phase to the inspiratory phase, the improvement comprising:

a patient breathing line for supplying gas from the respirator to the patient;

means to monitor the pressure in the patient breathing line during the expiratory phase,

means to sense the pressure in said patient breathing line during a period which commences a predetermined time period after commencement of the expiratory phase; and means to trigger the respirator into the inspiratory phase upon said patient's attempting to breathe, said means preventing triggering due to pressure declines generated by leaks from said system by effecting said triggering where a drop in said sensed pressure over a sub-interval of said period exceeds a minimum predetermined value; and said means further, disabling said triggering irrespective of the level of said sensed pressure where the average rate of pressure decline over said sub-interval is less than a second predetermined value.

3,896,801

EAR PLUG

Kenneth M. Grout, P.O. Box 621, Littleton, N.H. 03561

Filed May 29, 1973, Ser. No. 364,378
Int. Cl. A61f *11/00*
U.S. Cl. 128—152 **1 Claim**

1. An ear plug comprising:

a. a flat, imperforate, flexible plate adapted to provide an imperforate sound barrier, having a bottom surface adapted to contact the external surfaces surrounding the entrance to the auditory canal of the human ear, the flexibility of said plate to follow the contours of said surfaces when brought into contact therewith;

b. an elongated thin walled hollow flexible tubular member having one end secured to said bottom surface, the walls of said flexible member being substantially thinner than the thickness of said plate and having substantially no resiliency, the other end of said flexible member being closed;

c. said thin walled member being adapted to be inserted into said auditory canal to retain said bottom surface of said plate in contact with said external surfaces;

d. said bottom surface extending beyond the walls of said thin walled member around the entire periphery of said thin walled member, thus providing a portion of said bottom surface for contacting said external surfaces along the entire periphery of the entrance to said auditory canal;

e. the walls of said hollow member being provided with a plurality of folds extending longitudinally along the length of said hollow member from said one end to said other end.

3,896,802

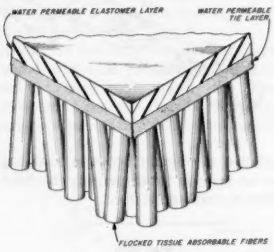
FLEXIBLE FLOCKED DRESSING

Bernard Leo Williams, Martinville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 19, 1974, Ser. No. 462,471
Int. Cl.[2] A61L *15/00*
U.S. Cl. 128—156 **9 Claims**

1. A wound dressing for the surface of living tissue from which at least part of the skin has been removed and which tissue is subject to moisture loss, and bacterial contamination, which dressing is sufficiently flexible that it will conform and

adapt to the surface of the tissue to minimize pools of fluid or air between the dressing and the tissue surface, which pools generate problems of infection, and which has a permeability to moisture of the order of that of the intact human skin (approximately 2.2 mg/sq. cm./hr.) which comprises: an elas-



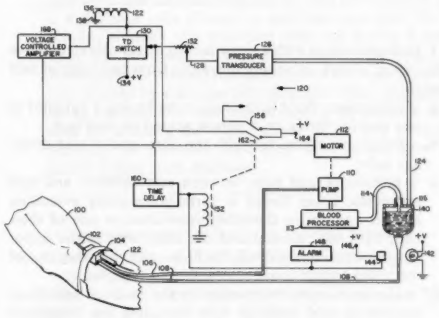
tomeric layer which elastomeric layer has adhesively flocked to its surface a layer of fibers and which fibers are of a tissue compatible material which is substantially absorbed by living tissue within about 90 days, and which fibers maintain their integrity for at least about 3 days.

3,896,803

VALVE CONTROLLED SINGLE NEEDLE BLOOD PROCESSING SYSTEMS

Barry Mason, Burbank, Calif., assignor to Betamite Electronic Devices, Culver City, Calif.

Filed Aug. 20, 1973, Ser. No. 389,892
Int. Cl. A61m *5/00, 1/03*
U.S. Cl. 128—214 R **7 Claims**



1. A blood access apparatus including:

a needle body portion having a pair of holes drilled in one end thereof and a round bore drilled partially through on side thereof intersecting said pair of holes;

a hollow needle in said needle body portion the end opposite said pair of holes and communicating with said round bore in said body portion;

switching needle means in said round bore in said needle body portion including direction channels for switching through access from said needle to said pair of holes;

a switching body portion having a channel therein which has a matching configuration of the needle body portion;

means in said switching body portion to switch said switching means;

said switching means including a protruding tongue;

said switching body portion including a hole in one end thereof and a round bore in said channel which intersects with said hole;

a rack and gear arrangement, said rack being disposed in said bore in said channel and engages said rack; and

a grooved member engaging said gear having a groove which engages the protruding tongue on said switching means.

3,896,804

CATHETER FOR SUBMUCOUS ADMINISTRATION OF LOCAL ANESTHETICS IN OBTAINING PARACERVICAL BLOCK

Fred Vage Gunnar Ekbladh, Saro, and Sven Lennart Steen, Kullavik, both of Sweden, assignors to Astra-Sjuco AB, Goteborg, Sweden

Filed Nov. 13, 1973, Ser. No. 415,352
Claims priority, application Sweden, Nov. 24, 1972, 15320/72
Int. Cl. A61m *5/00, 25/00*
U.S. Cl. 128—215 **4 Claims**

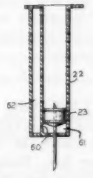
1. An improved catheter the forward end of which is adapted to be inserted submucously into the cervix for administration of a local anesthetic agent in obtaining paracervical block, said catheter comprising a tube which is provided near its forward end with a collar extending away from the tube and toward the rear of the tube, said collar encircling the whole circumference of the tube and being provided with axially directed slits, the distance from the forward end of the catheter to the collar being such that the catheter can be mounted submucously in the cervix with the collar imbedded therein.

3,896,805

MULTI-CHAMBER SYRINGE

Charles Z. Weingarten, Evanston, Ill., assignor to The Kendall Company, Walpole, Mass.

Continuation-in-part of Ser. No. 255,099, May 19, 1972, abandoned. This application Nov. 2, 1973, Ser. No. 412,164
Int. Cl. A61
U.S. Cl. 128—218 R **17 Claims**



1. A multi-chamber syringe, comprising: a cylinder having a cavity, a plunger having one end received in the cavity, at least one floating barrier means in said cavity forming at least first and second fluid chambers first and second liquids in said first and second chambers, needle means communicating with the first chamber and projecting into said cavity a sufficient distance to puncture said barrier means and communicate with the second chamber when said barrier means nears the

end of its travel as said syringe is emptied, openable port means for selectively relieving back pressure on said barrier means without mixing said liquids in said first and second chamber, whereby said barrier means may continue to settle after having relieved said pressure and means for selectively opening said port means.

3,896,806

IMPLANT FOR DIRECTED INFUSION OF BIOLOGICALLY ACTIVE SUBSTANCES

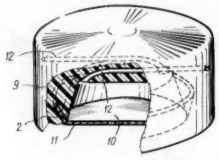
Otto Wichterle, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Dec. 21, 1971, Ser. No. 210,420

Claims priority, application Czechoslovakia, Jan. 8, 1971, 114-71

Int. Cl. A61m *31/00*

U.S. Cl. 128—260 **30 Claims**



1. An implant for the infusion of efficient substances comprising a hollow body formed of a physiologically inert elastic hydrophilic material, said body being formed of a cupped portion comprising a continuous substantially impermeable thick wall defining an interior chamber for receipt and storage of said substance and an opening, a permeable membrane integrally secured to said body and covering said opening to enclose said chamber, said membrane permitting directed diffusion of said substance stored within said chamber outwardly of said opening and at least one channel extending through said thick wall portion from said interior chamber to the outside of said body for access to said interior chamber for supplying said substance to said chamber.

3,896,807

ARTICLE IMPREGNATED WITH SKIN-CARE FORMULATIONS

Gilbert Buchalter, 555 Mt. Prospect Ave., Newark, N.J. 07014

Filed June 13, 1974, Ser. No. 478,924

Int. Cl. A61m *35/00*

U.S. Cl. 128—261 **26 Claims**

1. An article to place in contact with the body for use in applying a cosmetic or therapeutic substance to the skin, comprising a substrate and a therapeutic or cosmetic composition carried by said substrate and comprising the oil phase of a cream formulation, said oil phase being a dry emulsifiable solid, which upon addition of moisture thereto forms an oil in water or water in oil emulsion.

3,896,808

DISPENSING AND APPLICATING DEVICE AND PRODUCTION OF SAME

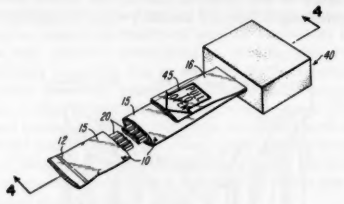
Roman Szpur, 2685 Culver Ave., Kettering, Ohio 45429

Filed July 8, 1974, Ser. No. 486,463

Int. Cl. A61m *35/00*

U.S. Cl. 128—269 **24 Claims**

1. A device adapted for dispensing a fluid into an applicator, comprising a flexible bag forming a container portion adapted to receive the fluid, a handle member extending within said container portion of said bag and providing said bag with increased rigidity, means for sealing said bag to confine the fluid and said handle member within said container portion, means for attaching said bag to said applicator, and said handle member including means for piercing at least one hole in said container portion of said bag adjacent said applicator in



response to relative movement between said bag and said handle member to provide for dispensing the fluid from said container portion to said applicator.

3,896,809

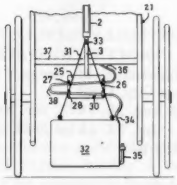
SUPPORT FOR A CONTINUOUS DRAIN UNIT CONNECTED WITH A CATHETER

Carl A. Samuel, and Euphemia Samuel, both of 5404 Broadway, Live Oak, Calif. 95953

Filed Sept. 24, 1973, Ser. No. 400,210

Int. Cl.[2] A61F *5/44*

U.S. Cl. 128—275 **3 Claims**



1. In combination with a chair having a seat elevated above a floor and a back extending upwardly from one edge of said seat:

a. a continuous, flexible drainage tube having a catheter at one end for fitting on a person seated on said seat;

b. a receptacle connected with the other end of said drainage tube;

c. a portion of said tube between said catheter and said receptacle being flexed to form horizontally extending lengths one above the other connected at one of their ends by a return bend and the other end of the upper length connected with said catheter with the other end of the lower length connected with said receptacle;

d. means removably supported on the back of said chair supporting said drainage tube including the lengths of said portion thereof extending downwardly from said seat to said receptacle and supporting said receptacle in a position rearwardly of said seat and below the level thereof.

3,896,810

ASPIRATOR FOR REMOVAL OF THE CONTENTS OF CYSTIC TUMORS

Hiroshi Akiyama, No. 2-5-12 Honkomagome Bunkyo-ku, Tokyo, Japan

Filed Dec. 21, 1973, Ser. No. 427,070

Claims priority, application Japan, Dec. 27, 1972, 47-130142

Int. Cl. A61m *1/00*

U.S. Cl. 128—276 **6 Claims**

1. An aspirator for particular use in removing the contents of a cystic tumor comprising in combination:

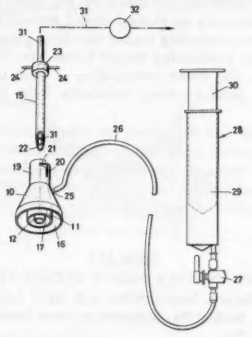
a. a hollow suction structure having a closed top and an open bottom for engaging the tumor for defining there-

with a vacuum chamber therein for attachment of the structure to the tumor;

b. a first source of negative pressure connectable to said vacuum chamber, said first source of negative pressure being of the type adapted to create a selectable degree of vacuum in said vacuum chamber;

c. a guide sleeve fixedly supported by and within said suction structure along the vertical axis thereof, said guide sleeve including a portion extending through said closed top of said suction structure;

d. a reciprocably movable puncture tube open at both ends and slidable in said guide sleeve and having a length greater than said guide sleeve, the lower end of said puncture tube being cut biaswise to define a cutting edge for making a puncture in the cystic tumor;



e. stop means acting between said puncture tube and said suction structure for supporting said puncture tube within said guide sleeve in such a position that said lower end of said puncture tube projects beyond said guide sleeve; and

f. a drainage tube slidable in said puncture tube for extending through said puncture tube and having a lower open end sized smaller than said puncture forming edge for being inserted into the cystic tumor through the puncture formed by said puncture tube, the other end thereof being connectable to a second source of negative pressure for draining the cystic tumor of its fluid contents, whereby the puncture tube may be retracted from the tumor during such drainage.

3,896,811

ULTRASONIC SURGICAL INSTRUMENT

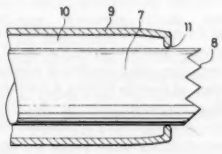
Karl Storz, Mittelstr. 8, 7200 Tuttlingen, Germany

Filed Aug. 30, 1973, Ser. No. 393,198

Claims priority, application Germany, Aug. 31, 1972, 2242863

Int. Cl. A61b *17/22;* **A61h** *23/02*

U.S. Cl. 128—328 **4 Claims**



1. An ultrasonic surgical instrument adapted to be mounted within an endoscope for inserting within an internal body organ, comprising an elongated probe, a transducer for inducing oscillation therein, means for connecting said transducer to one end of said probe, and a unitary jacket surrounding said probe and said transducer, said jacket being in cross section larger than said probe and transducer and having a pair of axially spaced radially inwardly directed bearing means for supporting said jacket on said transducer and on the probe at the end opposite said transducer spaced uniformly from said probe and said transducer to provide a radial air gap enveloping said probe and transducer.

3,896,812

SUTURES HAVING LONG-LASTING BIOCIDAL PROPERTIES

Leonard D. Kurtz, Woodmere, N.Y., assignor to Sutures, Inc., Coventry, Conn.

Continuation-in-part of Ser. No. 648,247, June 23, 1967, abandoned, and a continuation-in-part of Ser. No. 851,739, Aug. 20, 1969, abandoned, and a continuation-in-part of Ser. No. 243,425, April 12, 1972. This application Apr. 25, 1972, Ser. No. 247,469. The portion of the term of this patent subsequent to Feb. 15, 1989, has been disclaimed.

Int. Cl. A61l *17/00*

U.S. Cl. 128—335.5 **8 Claims**

1. A surgical suture having long-lasting bactericidal properties comprising a suture strand having incorporated substantially uniformly within the body thereof throughout its length an effective amount of a substantially water-insoluble salt of a cephalosporin and a basic antibiotic selected from the group consisting of gentamicin and a polymyxin, said substantially water-insoluble salt being held tenaciously in said suture strand to provide a long-lasting source of both said antibiotics.

3,896,813

SUTURES HAVING LONG-LASTING BIOCIDAL PROPERTIES

Leonard D. Kurtz, Woodmere, N.Y., assignor to Sutures, Inc., Coventry, Conn.

Continuation-in-part of Ser. No. 851,739, Aug. 20, 1969, abandoned, which is a continuation-in-part of Ser. No. 648,247, June 23, 1967, abandoned. This application Apr. 12, 1972, Ser. No. 243,425. The portion of the term of this patent subsequent to Feb. 15, 1989, has been disclaimed.

Int. Cl. A61l *17/00*

U.S. Cl. 128—335.5 **8 Claims**

1. A surgical suture having long-lasting bactericidal properties comprising a suture strand having incorporated substantially uniformly within the body thereof throughout its length an effective amount of a substantially water-insoluble salt of a penicillin and a basic antibiotic selected from the group consisting of gentamicin and a polymyxin, said substantially water-insoluble salt being held tenaciously in said suture strand to provide a long-lasting source of both said antibiotics.

3,896,814

COLLAGEN BASED THREADS

Daniel Vivien, 128 Avenue Georges Clemenceau, Nanterre, and Georg Schwartz, 9 Rue F. Joliot Curie, Goussainville, both of France

Filed Oct. 31, 1972, Ser. No. 302,437

Int. Cl. A61l *17/00*

U.S. Cl. 128—335.5 **4 Claims**

1. A collagen based suture comprising a collagen surgical thread containing therewithin from about 10 to 50 percent of water based on the weight of the thread and about 10 to 70 percent by weight of at least one hygroscopic agent for retaining the water and selected from the group consisting of glycerols, glycols and polyalkylene oxides, said hygroscopic agent having a low volatility and a molecular weight of up to about 400, and a hydrophobic lubricating agent on the surface and selected from the group consisting of lipoids and silicones, whereby said suture retains its suppleness in dry form.

3,896,815
EXPANSIBLE TIP CATHETERS

Bruce E. Fettel, Diamond Bar, and Samuel Burd, Long Beach, both of Calif., assignors to Shiley Laboratories, Inc., Santa Ana, Calif.

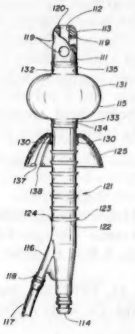
Filed June 6, 1974, Ser. No. 477,167
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—348 **3 Claims**

1. In an expansible tip embolectomy catheter of the type which is so constructed and arranged as to be inserted distal end first into blood passages in the body which comprise an elongate flexible tube sealed at the distal end and connected at the proximal end to a pressurized fluid source connector for supplying fluid under pressure into said tube during use, the improvement wherein:
- said tube has an outside diameter from about 0.026 inches to about 0.092 inches;
- an elongate portion of the tube adjacent the distal end is pre-stretched to be less resistant to lateral expansion than the remainder of the tube such that upon injection of fluid under pressure into said tube said elongate distal end portion expands laterally first, said lateral expansion beginning initially in and progressing along said elongate distal end portion in preference to lateral expansion of the remainder of said tube; and
- including an elongate flexible wire secured to the connector and the distal end of the tube, extending through the tube to prevent extension and to guide the tube during insertion.

3,896,816
DISPOSABLE CATHETER

Martin Mattler, 24575 Franklin Pk. Dr., Franklin, Mich. 48025

Continuation-in-part of Ser. No. 139,725, May 3, 1971, abandoned. This application May 14, 1973, Ser. No. 360,363
Int. Cl. A61m *25/00*
U.S. Cl. 128—349 B **1 Claim**

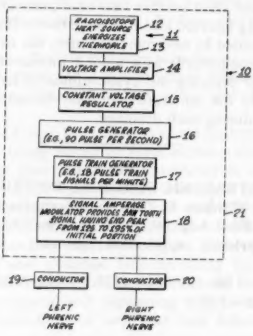


1. A catheter comprising:
- an elongated hollow tube having a forward end and a rearward end, the forward end being provided with a plurality of apertures to facilitate fluid delivery to a body cavity,
- a first opening in the tube wall proximate the forward end thereof,
- a sealing cuff mounted upon the tube over the area including the first opening, the sealing cuff comprising a thin walled, air impervious, resilient rubber-like material, the tube extending through the cuff and the cuff end portion being sealed to the tube such that the cuff may be inflated to an enlarged ring-shape co-axial with the tube for sealing a body cavity within which the tube is inserted;
- a second opening in the tube wall near the rearward end thereof;
- means disposed within the tube for interconnecting the first and second openings,
- a rearwardly and outwardly curved shield mounted below the cuff for sealing the body cavity, the shield including a central opening and having a rearwardly directed hub portion through which the tube is fitted,
- a plurality of fingers integrally formed with the hub and extending rearwardly therefrom, the fingers permitting forward sliding of the shield while resisting rearward movement of the shield,
- means for mounting the shield on the tube, the mounting means including an elongated slot provided through the shield and a coupling means for closing the slot,
- positive stop positioning means formed on the exterior of the tube, the means comprising at least one forwardly directed bead tapering outwardly from the tube, and wherein
- the openings and the means for interconnecting the openings cooperate to define an air inlet for flowing pressurized air into and for discharging air from the cuff to inflate and deflate, respectively, the cuff after the tube is inserted into the body cavity.

3,896,817
IMPLANTABLE NERVE STIMULATOR

Thomas F. Hursen, Monroeville, and Steve Andrew Kolenik, Leechburg, both of Pa., assignors to Arco Nuclear Company, Leechburg, Pa.

Filed Aug. 4, 1972, Ser. No. 277,963
Claims priority, application United Kingdom, Aug. 6, 1971, 37151/71
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 R **6 Claims**



1. In a respiratory pacer, the combination of:
- a nuclear battery providing several years of useful life;
- electrical means converting electrical power from said battery to a series of signals having a frequency per minute corresponding approximately to the desired breathing rate, each signal comprising a plurality of direct current pulses, one output terminal being a connector and the other output terminal for said electrical means being the hereinafter recited casing adapted to contact liquids between organs within the body, some such liquids being where the pacer is implanted, said electrical means including means for modulating the amperage of a signal so that its maximum amperage is within the range from

about 125 per cent to about 195 per cent of the minimum amperage of such signal;

at least one conductor transmitting signals from said connector toward a phrenic nerve; and

a casing containing said battery, electrical means, and said connector for said conductor, said casing hermetically sealing its contents from adverse effects attributable to said liquids, whereby the respiratory pacer may be implanted within a living body.

3,896,818

FOUNDATION GARMENT

Jack J. Locascio, Bayonne, N.J., assignor to Rapid-American Corporation, New York, N.Y.

Continuation of Ser. No. 359,934, May 14, 1973, abandoned. This application July 15, 1974, Ser. No. 488,618

Int. Cl.[2] **A41c** *3/00*

U.S. Cl. 128—494 **17 Claims**

1. A brassiere comprising:

a frontal portion;

body encircling means affixed laterally outward of said frontal portion and shoulder straps extending upward of said frontal portion including:

first and second breast receiving cups, each of said cups having a lower inner edge, an upper inner edge, an outer edge and a bottom edge; and breast cup framing means; said breast cup framing means including a distensible inner panel extending along the respective upper and lower inner edge of each of said breast cups, said distensible inner panels juxtaposed and secured to one another along a vertical medial line between the lower inner edges of said cups;

and means to selectively restrict the distensibility of said distensible inner panels as they extend along the upper inner edges of said cups;

said restricting means including a layer of non-stretchable material which spans in overlaying relationship and is secured to at least a portion of the respective inner distensible panel which extends along the upper inner edge of such cup such that the distensibility of said inner panels along said lower inner cup edges is retained.

3,896,819

IUD HAVING A REPLENISHING DRUG RESERVOIR

Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 42,786, June 2, 1970, Pat. No. 3,854,480, which is a continuation-in-part of Ser. Nos. 812,116, April 1, 1969, Pat. No. 3,598,122, and Ser. No. 864,175, Oct. 6, 1969, abandoned. This application Sept. 30, 1971, Ser. No. 185,208

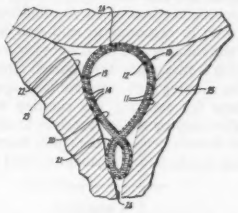
Int. Cl. A61f *5/46;* **A61m** *31/00*

U.S. Cl. 128—130 **12 Claims**

1. An intrauterine device comprising means having a configuration exerting an anti-fertility effect when placed in the uterine cavity and drug delivery means for providing programmed delivery of drug at a rate of delivery characterized by substantially zero order time dependence for a prolonged period of at least one month, said drug delivery means comprising:

a. reservoir comprising dissolved drug and undissolved replacement drug in a liquid carrier material having limited solubility for the drug and permeable to the passage of the drug, the replacement drug being present in an amount sufficient to maintain the dissolved drug in an amount substantially equal to the amount of dissolved drug originally present in the carrier material during said prolonged period; and

b. a shaped wall surrounding said reservoir, said shaped wall being capable of maintaining its integrity during said prolonged period and being formed at least in part of a substantially homogeneous drug release rate controlling



material permeable to the passage of the drug but having a lower permeability to the drug than the permeability thereto of the liquid carrier material;

said means having a configuration exerting an antifertility effect comprising the outer configuration of said shaped wall; said shaped wall being of such size and shape to contact the sides of the uterus when said device is placed in the uterine cavity;

said device when placed in the uterine cavity continuously releases drug from the reservoir at a controlled contraceptively effective rate by metered passage through the wall, the dissolved drug so released being replaced by the continuous dissolving of replacement drug in the carrier material.

3,896,820

APPARATUS FOR SPLICING WEBS OF CIGARETTE PAPER OR THE LIKE

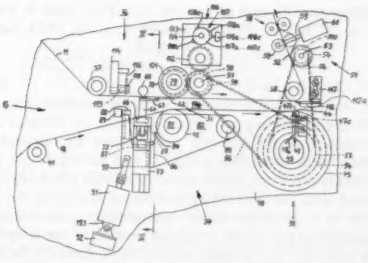
Dieter Ludszeweit, Hamburg, Germany, and Joachim Buchegger, Richmond, Va., assignors to Hauni Werke Korber & Co. KG, Hamburg, Germany

Filed Dec. 18, 1972, Ser. No. 316,295

Claims priority, application Germany, Dec. 17, 1971, 2162707

Int. Cl. B65h *19/10;* **A24c** *5/34*

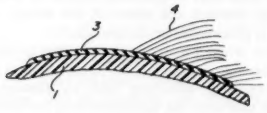
U.S. Cl. 131—21 R **11 Claims**



1. In a cigarette rod making or analogous machine wherein a running web of cigarette paper or the like which is being

withdrawn from an expiring roll is transported lengthwise along a predetermined path extending toward, through and beyond spaced-apart first and second stations and is converted into wrappers of discrete rod-shaped articles not later than at said second station, and wherein the leading end of a fresh web which is stored in the form of a fresh roll is maintained in readiness at said first station, a combination comprising means for advancing the running web along said path and a splicing apparatus, said splicing apparatus including means for accelerating the leading end of the fresh web and signal generating means having a first portion, drive means for transmitting motion to said first portion from said advancing means in response to acceleration of the leading end of the fresh web and a second portion for furnishing a plurality of signals in response to movement of said first portion, said signals including a first signal and said splicing apparatus further comprising means for uniting portions of the running web and the accelerated fresh web in response to said first signal so that said portions of the running and fresh webs form at said first station a splice which is thereupon transported along said path at the speed of the running web, said splicing apparatus also comprising means for severing the running web between said splice and the expiring roll in response to one of said plurality of signals to thereby separate the splice from the expiring roll, said severing means being adjacent to said path.

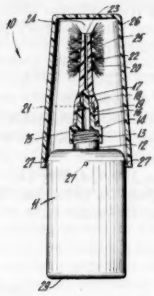
3,896,821
REPRODUCTION OF THE ORIGINAL HAIR
June G. Clark, 11 N. Park St., Belleville, Ontario, Canada
Filed Mar. 8, 1974, Ser. No. 449,538
Int. Cl. A41g *3/00*
U.S. Cl. 132—5 **12 Claims**



1. A method of making a hairpiece for the top of a wearer's head comprising: coating a portion of a mold corresponding to the shape of a wearer's head with a single layer of liquid elastomeric material which hardens on exposure to air; inserting a plurality of hairs all at the same time into said elastomeric material while it is in a liquid state; repeating the inserting of a plurality of hairs a number of times until a desired area is covered with hair; and allowing said elastomeric material to harden in order to secure the implanted hairs therewithin.

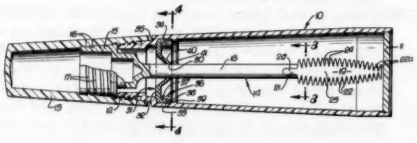
3,896,822
BRUSH APPLICATOR DEVICE
Eli Zimmerman, 159 W. 76th St., Apt. 5A, New York, N.Y. 10023
Continuation-in-part of Ser. No. 131,275, April 5, 1971, Pat. No. 3,734,106. This application Apr. 30, 1973, Ser. No. 355,962
Int. Cl. A45d *40/00*
U.S. Cl. 132—79 B **10 Claims**

1. A brush device comprising in combination: a squeezable bulb means having an outlet opening, an adapter member connected to the squeeze bulb means and extending outwardly from the opening thereof and having a hole at a substantially distal end of the adapter through which liquid can be forced with the hole being structured such that the hole extends in a direction facing substantially transversely to the longitudinal axis of the extended portion of the adapter member such that liquid spray is directable laterally to the elongated adapter member, and a brush means carried on the outwardly extending member in flow-non-alignment with the hole and spaced from the hole, said outwardly extending adapter member being of a resilient semi-rigid composition and having a portion thereof at a point distant from said adapter member shaped such that the bulb means includes a supporting base supportable of the adapter member and of the



brush mounted on the adapter member substantially above the supporting base when said bulb means is set on a substantially flat horizontal surface whereby the brush means is held in a position free of contact with the horizontal surface.

3,896,823
COSMETIC APPLICATOR
Walter B. Spatz, Pacific Palisades, Calif., assignor to Spatz Corporation, Venice, Calif.
Filed Feb. 1, 1974, Ser. No. 438,578
Int. Cl. A45d *40/26*
U.S. Cl. 132—88.7 **14 Claims**

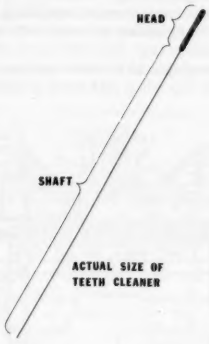


1. A cosmetic applicator: comprising a container for cosmetic material; an elastic deformable wiper having an opening; an applicator member movable through said opening into and from said container, said member including an inner portion adapted to be coated by the cosmetic material and having longitudinally spaced tines, said inner portion and its tines being of oval shape in cross-section and convex around their entire perimeter, whereby said wiper engages and wipes the entire perimeter of said inner portion and its tines as said inner portion is moved longitudinally through said wiper opening.

3,896,824
TEETH CLEANING
Thomas F. Thornton, 221 Mill Rd., New Canaan, Conn. 06840
Continuation-in-part of Ser. No. 138,501, Aug. 27, 1971, abandoned. This application May 17, 1973, Ser. No. 361,237
Int. Cl.[2] A61C *15/00*
U.S. Cl. 132—89 **8 Claims**

1. A teeth cleaner for passage through a crevice formed between adjacent teeth comprising an elongate flexible string portion and an elongate brush portion secured to the string portion, said brush portion being of spongy, elastic material formed to have a cross-sectional extent normally substantially larger than the cross-sectional extent of the string portion and formed of a plurality of textured commingled filaments that

have been permanently deformed and crinkled and in which the string portion is formed of a plurality of essentially straight



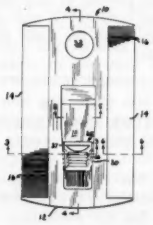
filaments that are unitary with the filaments of the brush portion.

3,896,825

COMB-CLEANING PICK CONSTRUCTION

Emil P. Norman, 339 Concord Ave., Bronx, N.Y. 10454

Filed Nov. 8, 1973, Ser. No. 413,904
Int. Cl. A45d *24/42*
U.S. Cl. 132—119 **6 Claims**



1. A combination comb-cleaning pick comprising: a comb having a comb body; a plurality of spaced combing teeth extending from said comb body; a pick member selectively separable from said comb, said pick member having a plurality of pick teeth spaced and dimensioned to fit between the combing teeth of said comb; said comb body formed with a pick retaining recess dimensioned to accommodate said pick member in said recess for detachably retaining said pick member; said recess formed with a pick seating bed having a flat portion spaced from the top surface of said comb body to seat said pick member in said recess; and an overhang lying over said bed, said overhang engaging said pick to detachably retain same in said recess.

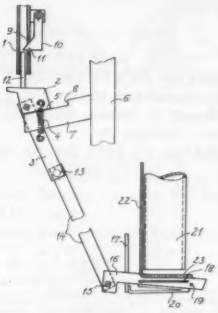
3,896,826

COIN CHANGER

Evy Petersen, Ostervangsvej 23, Gjesing DK-6700 Esbjerg, Denmark

Filed Oct. 19, 1973, Ser. No. 407,846
Int. Cl. G07d *1/04*
U.S. Cl. 133—4 **2 Claims**

1. Coin changer of the type, in which by insertion of a coin, by way of example a 5-crown piece and by operating a release mechanism, one can release a definite number of coins for change, e.g. five 1-crown pieces, from a coin changing magazine in the changer, which magazine comprises a number of mainly vertical columns of coins, from the bottom of which the lowest coin or coins of each column can be pushed out horizontally by means of a pushing mechanism, characterized in that two mainly horizontal guide flaps (**18**) are situated on the same level and at a certain distance under each column (**21**), said flaps forming a split-like opening under the column in question, a horizontally displaceable pusher (**16**) operably associated with said split-like opening with the direction of displacement of said pusher being influenced by the release mechanism (**1–14**) of the changer through a linkage (**15**), said



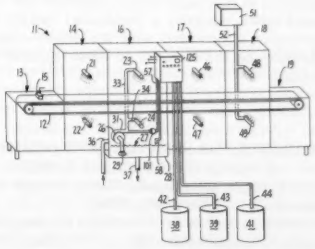
pusher (**16**) having two sideways extending guide pins (**19**) for cooperation with the flaps (**18**), a tongue-like spring (**20**) being located under the pusher (**16**), said spring stressing the pusher by an upwards directed pressure, and said guide flaps (**18**) being limited in extension in the direction of displacement to the extent that in the end positions of the pusher the guide pins (**19**) pass beyond the end edges of the flaps (**18**) with the guide pins moving along the under sides of said flaps on retracting to a change ejecting condition and above the upper sides of said flaps during change ejection, and said guide pins (**19**) being vertically adjustable in relation to the top side of the pusher (**16**) in question.

3,896,827

DISH MACHINE MONITORING OF TIME, TEMPERATURE, ALKALINITY, AND PRESSURE PARAMETERS

Norman R. Robinson, 6902 Brighton Dr., Dublin, Calif. 94566

Filed Aug. 31, 1973, Ser. No. 393,345
Int. Cl. B08b *3/10*
U.S. Cl. 134—10 **13 Claims**



1. In a method of controlling continuous automatic dishwasher operation wherein the dishes are transported through a device comprising at least a washing station and a rinse station and dishwashing additives are automatically introduced into circulating dish washing liquid which contacts

dishes at said washing station, the improvement comprising commencing washing operation by mechanically sensing presence of dishes to be washed, stopping operation of the device at the conclusion of rinsing, measuring and recording the duration of operation of the device, continuously sampling the circulating dish washing liquid during operation of the device to automatically determine:

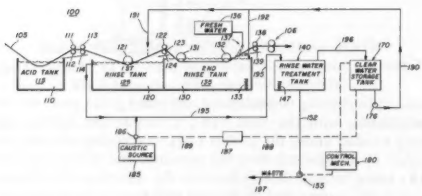
1. the temperature and signalling when a temperature is determined to be below a predetermined value,
2. alkalinity and adding dish washing additives to the circulating water when alkalinity is determined to be below a predetermined value, and
3. pressure and signalling when pressure falls below a predetermined value.

3,896,828

TREATMENT OF PICKLE LIQUOR RINSE WATER

James J. Foster, Homewood, Ill.; Richard J. Sittema, Munster, Ind., and Russell E. Nelson, Riverdale, Ill., assignors to Interlake, Inc., Chicago, Ill.

Filed Oct. 23, 1973, Ser. No. 408,654
Int. Cl. B08b *3/10*
U.S. Cl. 134—57 R **15 Claims**



1. A system for rinsing metal strapping emerging from a hydrochloric acid pickling bath, said system comprising a first rinse bath and a second rinse bath in communication with said first rinse bath, a rinse water treatment tank in communication with said first rinse bath, a clarified water storage tank in communication with said rinse water treatment tank and with said first rinse bath and said second rinse bath, means for passing the metal strapping emerging from the hydrochloric acid pickling bath through said first rinse bath and said second rinse bath, means for rinsing the metal strapping emerging from said first rinse bath with clarified water from said clarified water storage tank, means for rinsing the metal strapping emerging from said second rinse bath with fresh water, mechanism for adding a sodium hydroxide solution to the rinse water from said first rinse bath, and means for removing precipitated magnetite from said rinse water treatment tank to maintain the liquid level in said rinse water treatment tank within predetermined limits, whereby a continuous system for rinsing metal strapping is provided with the introduction of fresh water thereto and the removal of waste material therefrom being limited.

3,896,829

APPARATUS FOR SPRAYING AND OTHERWISE TREATING PIECES IN A VAPOR

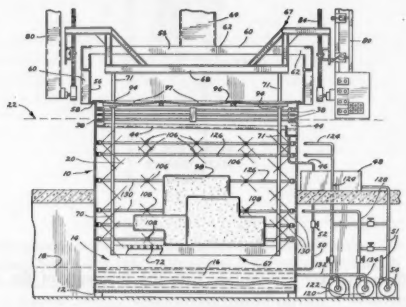
Winston E. Sabatka, Minneapolis, Minn., assignor to Finishing Equipment, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 171,129, Aug. 12, 1971, abandoned. This application July 2, 1973, Ser. No. 375,763
Int. Cl. B08b *3/02, 3/10, 15/02*
U.S. Cl. 134—58 R **12 Claims**

1. In an apparatus for treating work pieces in a vapor, including an open top tank, a treatment fluid having a liquid phase and a heavier-than-air vapor phase, means for applying heat energy to a bottom portion of said tank to cause said fluid to boil to form in said tank a layer of vapor phase and a layer of liquid phase, cooling means at the top of said tank to condense said vapor phase reaching said cooling means to limit the upper level of vapor in said tank, a stage for receiving work pieces to be processed, and means for lowering said stage into and raising said stage out of said tank through the open top thereof, the improvement comprising:

a. a tank lid of configuration to completely close the open top of said tank;

b. means for bringing said lid into closing relationship to said open tank top when said work is positioned within



said tank and to move said lid into open relationship with said tank as the work leaves the tank;

c. said means for moving said lid including means for carrying said lid on an upper portion of said stage in alignment with said treatment tank opening; and

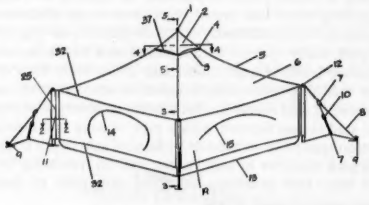
d. said tank being provided with a tank lid receiving shoulder around the entire periphery thereof to receive the entire outer edge portion of said tank lid and a vertical upstanding collar constituting part of said tank and extending upwardly from the outer periphery of said lid receiving shoulder.

3,896,830

TENT STRUCTURE AND SUSPENSION MEANS

Paul Robert Sharick, P.O. Box 16053, Sacramento, Calif. 95816

Continuation of Ser. No. 278,034, Aug. 4, 1972, abandoned. This application Nov. 12, 1973, Ser. No. 414,920
Int. Cl.[2] A45F *1/18*
U.S. Cl. 135—1 R **7 Claims**



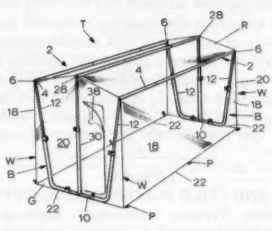
1. A tent comprising a plurality of sidewalls, a top and bottom joined together in a continuous surface of flexible material, the sidewalls being formed from a continuous closed loop of flexible material, a plurality of rigid members of sufficient length to span the vertical width of the sidewall, securing means attaching the rigid members to the sidewall material at the corners of the tent, the securing means attaching the rigid members to the sidewall material uniformly over the full vertical widt of the material, anchor means positioned outside each corner, and tensioning means linking both ends of each of the

rigid members to a corresponding one of the anchor means, the tension means pulling on each of the corners in an outward direction in relation to the center of the tent, the tension means being resisted substantially only by lateral tension in the closed loop of material forming the sidewalls, the later tension being distributed essentially uniformly over the full vertical width of the sidewall material by virtue of the distribution of the attachment of each rigid member to the sidewall material uniformly over the vertical width of the sidewall material.

3,896,831
TENT

Benjamin L. Feldman, 35 Canyon Ave. No. 201, Downsview, and Frederick M. Gaby, 100 Rosedale Height Dr., Toronto, Ontario, both of Canada

Filed Oct. 4, 1973, Ser. No. 403,570
Int. Cl. A45f *1/16*
U.S. Cl. 135—3 R **9 Claims**



1. A tent comprising:

a roof and framing for supporting said roof at an elevation and for applying tension thereto to maintain it in outstretched condition; said framing including:

eaves poles attachable to said roof at opposite margins thereof, said roof including tunnels extending along opposite margins thereof into which said eaves poles are removably insertable to attach them to said roof as aforesaid, said eaves poles having ends which are exposed at the corresponding ends of said roof margins when said eaves poles are inserted in said tunnels, and said framing also including bows disposable on the ground between said margins for engaging and applying a spreading force to the eaves poles to tense the roof between them and to prop it at an elevation, each said bow being installable and removable independently of the other bow and including an elongated sill positionable on the ground and a prop interconnectible between said sill and an exposed end of each said eaves pole; the props and eaves poles having means for readily engaging and disengaging each eaves pole with and from the upper ends of the respective props, the props being in fixed angular relationship with said sill and diverging therefrom towards said eaves poles to apply spreading and propping forces thereto as aforesaid, each sill having opposite end portions from which the respective props are integral extensions, and each bow having means for manually adjusting its length to a selected fixed length for manual adjustment of said spreading and propping forces.

3,896,832
CANOE TENT

Thomas Montoya, 106 Illinois Ave., Auburndale, Fla. 33823

Filed Oct. 24, 1973, Ser. No. 409,308
Int. Cl. B63b *17/02*
U.S. Cl. 135—6 **13 Claims**

1. A tent for watercraft having a tapered bow, comprising:

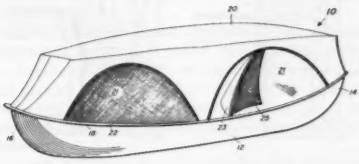
a shroud;

means for joining the periphery of said shroud along the gunwale of said craft;

a removable bow member adapted for mounting on said tapered bow, said bow member comprising;

a tapered member adapted to engage the gunwale on opposite sides of the craft,

a support shaft holding member pivotably joined at one edge to said tapered plate, and



a support shaft carried by said holding member;

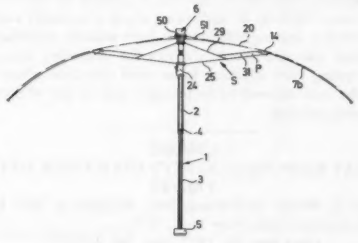
resilient means fixed between said tapered member and the extremity of said holding member for supporting said shroud at said bow; and

means for adjusting said shroud for watercraft of different lengths.

3,896,833
TELESCOPIC UMBRELLA

Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Canada

Filed Dec. 5, 1973, Ser. No. 421,953
Claims priority, application Germany, Dec. 7, 1972, 2259874
Int. Cl.[2] A45B *19/00*
U.S. Cl. 135—25 R **9 Claims**

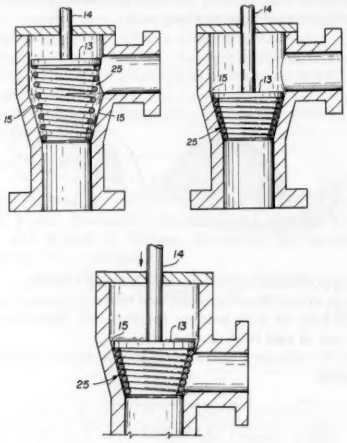


1. In a telescopic umbrella including a telescopic shaft, a crown at one end of the shaft, spokes adapted to pivot relative to the crown a cover attached to the crown and the spokes, at least a main runner mounted on the shaft, support means operatively connected between said main runner and said spokes for effecting pivoting movement of said spokes relative to said shaft, and a system of resilient stays on said shaft adjacent said crown for effecting folding of the cover as the umbrella is telescopically collapsed and forming a mushroom shape from the cover adjacent the crown, the improvement in that said resilient stays comprise helical coil springs terminally connected to the shaft beneath said crown, said stays being bendable about a wire forming a coil attached to the shaft, said coil springs being connected to said shaft in an area within an axial projection of said crown and bendable substantially parallel to the shaft when collapsed for providing a minimum cross-section adjacent the crown when the umbrella is collapsed.

3,896,834
VALVES WITH SPRING VALVE MEMBERS

Herman L. Paul, Jr., 720 Old Mill Rd., Wyomissing, Pa. 19610

Filed Oct. 9, 1973, Ser. No. 404,591
Int. Cl.[2] F16K *11/04*
U.S. Cl. 137—625.28 3 Claims

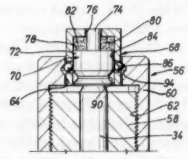


1. A valve including, a body provided with an internal cavity, inlet and outlet passages extending from the exterior of said body into communication with said internal cavity, a valve element located within said internal cavity for controlling fluid flow from one of said passages to the other thereof, said internal cavity including a portion of inverted frusto-conical configuration adjacent to and in alignment with one of said passages for receiving said valve element, said valve element comprising a coiled spring of frusto-conical configuration complementary to the frusto-conical portion of said internal cavity when the coils of said spring are in a mutually contacting condition, and means operable from without said body and extending into said internal cavity for operating upon said coiled spring valve element in an axial direction whereby to cause the coils thereof to be brought into or out of mutually contacting relation.

3,896,835
HEAT RESPONSIVE SAFETY DEVICE FOR GATE VALVES

Charles H. Wicke, Richmond, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,123
Int. Cl.[2] F16K *17/38*
U.S. Cl. 137—75 2 Claims

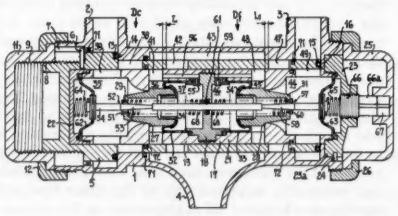


1. A heat responsive release assembly for an outwardly biased valve stem, the assembly being mounted on a threaded extension of a cylinder for a valve actuator and comprising, an internally threaded sleeve threaded on said extension, an inverted cap detachably mounted within said sleeve, a plug movably mounted within said cap and engaging said stem, a fusible material positioned within the inverted cap between the plug and the adjacent end surface of the inverted cap, said plug being urged by the thrust of the valve stem against the fusible material, said assembly having at least one metering opening for the fusible material provided adjacent the fusible material and upon a predetermined temperature being reached the fusible material melting and flowing through said metering opening to reduce the volume of fusible material adjacent said plug to permit outward movement of the plug under the bias of the valve stem, a plurality of spherical ball elements for releasably locking the inverted cap to the sleeve, a plurality of radially spaced openings in the wall of said inner cap receiving the ball elements therein with said ball elements being of a diameter greater than the wall thickness of said inner cap, said sleeve having an inner annular groove therein adjacent said radially spaced openings and receiving a projecting portion of the ball elements for releasably holding the inner cap within said sleeve, said plug having an annular groove therein spaced inwardly of said ball elements when said inner cap is releasably locked in position by said spherical ball elements, said plug groove upon outward movement of said plug being disposed adjacent and receiving said spherical ball elements to permit disengagement of said ball elements from the groove of said sleeve and release of said cap from said sleeve, said cap having a central end opening therein and said plug having a reduced diameter cylindrical extension thereon fitting within said end opening, and said fusible material being ring shaped and fitting about said cylindrical extension between said plug and the end surface of said cap.

3,896,836
HOT AND COLD WATER MIXING DEVICE

Claude Labarre, Vernier, Switzerland, assignor to Kugler Fonderie et Robinetterie S.A., Geneva, Switzerland

Filed Sept. 27, 1973, Ser. No. 401,361
Claims priority, application Switzerland, Oct. 4, 1972, 14467/72
Int. Cl. G05d *11/02; 23/13*
U.S. Cl. 137—98 10 Claims



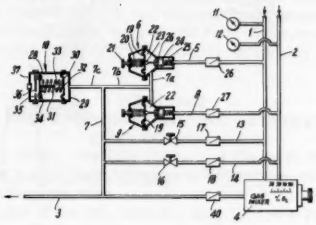
1. In a device for mixing hot and cold water, said device having a housing, a hot water inlet and a cold water inlet disposed to the housing, an outlet on the housing for a mixture of hot and cold water passing from said hot and cold water inlets, two upstream chambers disposed within the housing, one each in communication with the hot water inlet and the cold water inlet, two downstream chambers disposed within the housing, one each in communication with said upstream chambers, said downstream chambers disposed in communication with a hot and cold water mixing chamber within the housing, said mixing chamber being in communication with said water outlet, and a hot water distributor and cold water distributor each positioned intermediate an upstream and downstream chamber, the improvement which comprises, the hot water distributor and cold water distributor, each distributor including a valve, a membrane supporting the valve, a seat whereon the membrane supports the valve, the valve seat being arranged between an upstream chamber and a downstream chamber, the membrane delimiting a counterpressure chamber, a nozzle mounted for movement with the valve, and

a tapering central rod passing through the nozzle and defining therewith a variable passage in communication with the upstream chamber and with a feed opening in the membrane for interconnecting the upstream and counterpressure chambers, said counterpressure chamber communicates with the downstream chamber through a calibrated outlet channel the central rod being axially movable, and a compensating piston mounted in the upstream chamber and biasing the rod for axial movement under the pressure in the upstream chamber.

3,896,837
GAS MIXING APPARATUS PARTICULARLY FOR RESPIRATORS AND MEDICAL DEVICES

Holmer Rohling, Reinfeld, Germany, assignor to Dragerwerk Aktiengesellschaft, Germany

Filed Oct. 3, 1973, Ser. No. 402,886
Claims priority, application Germany, Oct. 13, 1972, 2250174
Int. Cl. F16k *19/00*
U.S. Cl. 137—110 **8 Claims**

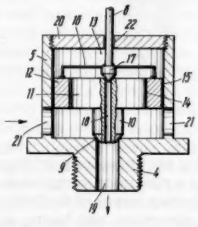


1. A gas mixing apparatus for gases under pressure, particularly for respirators and medical devices, comprising a gas mixer device, a plurality of compressed gas supply lines connected to said gas mixer device, at least one mixed gas delivery line extending out of said gas mixer device for the discharge of a mixture of gases from said compressed gas supply lines from said gas mixer device, and at least one by pass line connected from a compressed gas supply line to said delivery line and having an automatic pressure operated shutoff valve therein responsive to a drop in pressure in said delivery line to feed gas through said by pass line to said delivery line whenever the pressure therein drops below a predetermined value, said at least one by pass line comprising a by pass line connected to each of said supply lines each having an automatically operable pressure operated shutoff valve.

3,896,838
VALVE

Werner Foller, Heiligenrode, Germany, assignor to Gestra-KSB Vertriebsgesellschaft, Bremen, Germany

Filed Oct. 7, 1974, Ser. No. 512,596
Claims priority, application Germany, Oct. 15, 1973, 235176
Int. Cl.² F17T *1/20*
U.S. Cl. 137—195 **5 Claims**



1. A float controllable valve responsive to a level of fluid comprising:

a housing having an internal chamber including an input supply opening and a discharge opening;

a cylinder disposed above the discharge opening within the internal chamber of said housing, said cylinder having at least one side open and communicative to the housing chamber;

a control piston moveably disposed in said cylinder and having a main locking member in sealing contact with the discharge opening, said piston and locking member having a connecting channel formed therethrough and connecting the inner cylinder chamber with the low pressure side of the valve;

an auxiliary piston moveably disposed in said cylinder and adjacent to said control piston, and defining a first annular throttle opening between said auxiliary and said control pistons and a second annular throttle opening between said auxiliary piston and said cylinder, said throttle openings connecting the cylinder chamber to the housing chamber;

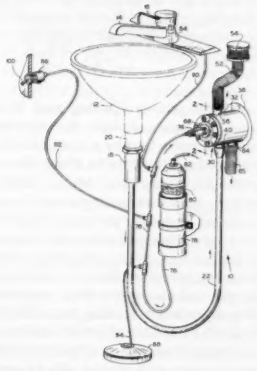
an auxiliary locking member disposed in said inner cylinder chamber and coupled to said auxiliary piston and sealing said connecting channel; and

a float disposed within the housing chamber and coupled to said auxiliary locking member.

3,896,839
VACUUM DRAIN

George K. Austin, Jr., P.O. Box 209, Rt. 2 Box 254, Newberg, Oreg. 97132

Filed Mar. 18, 1974, Ser. No. 451,988
Int. Cl. F16k *45/00*
U.S. Cl. 137—216.1 **11 Claims**



1. In a vacuum drain,

trap means,

a valve unit having closure means and a body provided with a first inlet connected to the trap means, a second inlet connected to the atmosphere, and an outlet,

vacuum means connected to the outlet for withdrawing liquid from the trap means and air from the second inlet, the valve having a closure member movable between a closed position closing the inlets from the outlet and an open position opening the inlets to the outlet,

and control means for moving the closure member selectively to one or the other of its positions.

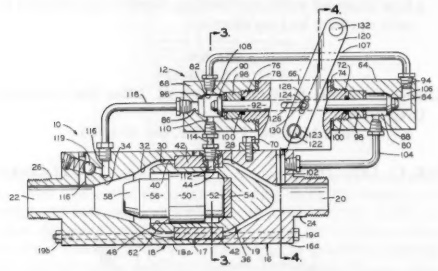
3,896,840
PILOT OPERATED FLOW CONTROL VALVE

Sven E. Andersson, 138 Lakeview Ln., Chagrin Falls, Ohio 44022

Filed May 1, 1974, Ser. No. 465,844
Int. Cl.² F16K *31/42*
U.S. Cl. 137—219 **14 Claims**

14. A fluid pressure operated flow control valve comprising, housing means having a main fluid flow passageway there-

through having upstream and downstream ends with respect to the direction of fluid flow therethrough, a main valve seat in said main passageway between said upstream and downstream ends a main valve element reciprocable axially of said seat and movable into engagement therewith in the direction of fluid flow to close said main passageway, piston means for reciprocating said main valve element, means defining a piston chamber in said main passageway receiving and reciprocably supporting said piston means, said housing means including first and second valve element chambers laterally spaced from said main passageway and axially aligned and spaced apart from one another, said valve element chambers having aligned outlet passageways opening into the axially opposite ends thereof, a reciprocable actuator rod coaxial with said valve element chambers and having opposite ends extending into said valve element chambers through the axially adjacent ends thereof, first and second valve elements respectively in said first and second valve element chambers and connected to the corresponding end of said rod for reciprocating movement therewith, each said first and second valve elements being adapted to engage and close the corresponding outlet



passageway, said rod axially spacing said first and second valve elements a distance less than the axial space between said outlet passageways, whereby movement of either of said first and second valve elements to close the corresponding outlet passageway moves the other to open the corresponding outlet passageway, first flow path means for delivering upstream fluid into said first valve element chamber at a location behind said first valve element when said first valve element closes the corresponding outlet passageway, second flow path means for delivering upstream fluid to said second valve element chamber and said piston chamber, said second flow path means including a portion extending from the outlet passageway of said first valve element chamber and opening into said second valve element chamber at a location behind said second valve element when said second valve element closes the corresponding outlet passageway, third flow path means for delivering upstream fluid from said piston chamber and second valve chamber through the outlet passageway of said second valve chamber to a location downstream from said main valve seat, and means to reciprocate said rod to alternatively move said first and second valve elements to close the outlet passageway of the corresponding valve chamber.

3,896,841

CONSTANT WEIGHT-CONSTANT DIMENSION COUPLING ASSEMBLY FOR MARINE LOADING ARMS

Allan R. Bahlke, Placentia, Calif., assignor to FMC Corporation, San Jose, Calif.

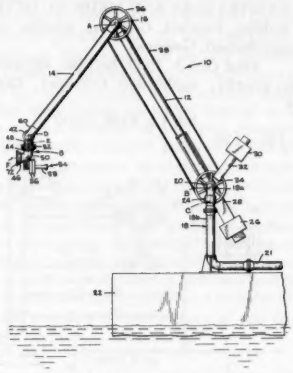
Filed Mar. 21, 1974, Ser. No. 453,653
Int. Cl. F16l *3/00*; B65g *67/00*
U.S. Cl. 137—271 **18 Claims**

1. In a fluid loading arm having at least one fluid conducting pipe section supported for pivotal movement about a first generally horizontal axis, and having an outer end for coupling the arm to a fluid conduit of a transport vessel, the improvement comprising a constant weight-constant dimension coupling assembly at the outer end of the arm, said coupling assembly including

a. a plurality of pipe swivel joints oriented on mutually perpendicular axes,

b. at least one curved pipe section interconnecting the swivel joints, and

c. a simulator for a flow control valve, the simulator positioned in the coupling assembly and releasably interconnected therewith at a location that will affect the moment



load exerted by the assembly on the loading arm, said simulator comprising a flow conduit whose weight is equal to the total weight of said flow control valve and whose axial dimension is equal to the corresponding dimension of said valve,

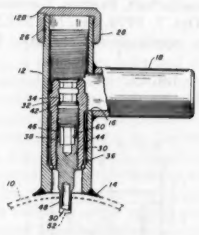
whereby interchanging the simulator and the complete flow control valve results in no change in the existing conditions that have an effect on pivotal movement of the arm about the first generally horizontal axis.

3,896,842

COMBINATION PUNCH AND VALVE TEE FITTING

Judson C. Cole, Tulsa, Okla., assignor to Continental Industries, Inc., Tulsa, Okla.

Filed May 13, 1974, Ser. No. 469,101
Int. Cl. B23b *41/08*; F16e *41/04*
U.S. Cl. 137—318 **5 Claims**



1. A self-punching tee-fitting for providing communication with the interior of a pipe main, comprising:

a tubular body having means at the lower end thereof for affixing to a pipe main, and having an outlet opening intermediate the ends encompassed by a tubular outlet adaptable to receive the connection of a distribution pipe thereto, the tubular body having internal threads, and an

internal valve seat below the threads and below the outlet opening;

a tubular plug valve member having external threads threadably received in said tubular body, the upper end of the plug valve member having wrench engaging means whereby the plug valve member may be threadably positioned in said body, the plug valve member having a seat portion sealably engagable with said body valve seat when the plug member is threadably downwardly advanced, the plug member having internal threads in the lower portion thereof and an internal valve seat above the threads; and an externally threaded cylindrical punch threadably received in said plug valve member, the lower end of the punch having a punching surface thereon, the upper end of the punch having wrench receiving means, the punch having a sealing surface sealably engagable with the said plug member internal valve seat when the punch is threadably upwardly positioned relative to said plug member, whereby when the punch is downwardly threadably advanced it punches a hole in a pipe main to which the body is affixed, and wherein free communication is provided for gas flow out said body outlet opening when the plug valve member is upwardly threadably positioned.

3,896,843

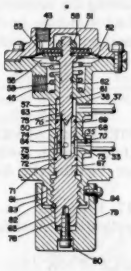
PILOT VALVE FOR CONTROLLING A FLUID PRESSURE OPERATED VALVE

James S. Millar, Fountain Valley, and Glenn W. Henderson, Tustin, both of Calif., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Division of Ser. No. 359,464, May 11, 1973, Pat. No. 3,820,556. This application Dec. 13, 1973, Ser. No. 424,199

Int. Cl. G05d *7/03*; **F16k** *31/363*

U.S. Cl. 137—486 **2 Claims**



1. A pilot valve comprising a housing having first and second chambers connected by a bore, a movable wall dividing the first chamber into high and low pressure compartments, a high pressure port for introducing fluid to the high pressure compartment and a low pressure port for introducing fluid to the low pressure compartment, a valve plug member connected to the movable wall and extending through said low pressure compartment and the bore into the second chamber, sealing means in said bore sealing the low pressure compartment from the second chamber, a counterbore in said housing, a valve seat member in said counterbore having a passage therethrough connectable to the second chamber and in constant communication with a third port that intersects said counterbore, a fourth port connected to the second chamber, manually operable means directly connected to the valve seat member and axially movable within said counterbore for positively adjusting the axial position of the valve seat member in said counterbore, said valve plug member and said valve seat member being cooperable for controlling flow of fluid between said passage and said second chamber, said means having a threaded connection directly with said housing for accomplishing said adjustment, another sealing means in contact with said valve seat member and the wall of said counterbore between said third port and said threaded connection that seals said threaded connection relative to said third port in the adjusted positions of said valve seat member.

3,896,844

FLUID FLOW REGULATING APPARATUS

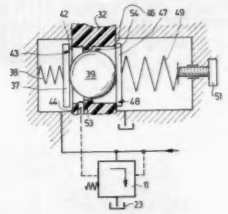
Werner Schumacher, Asperg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Apr. 1, 1974, Ser. No. 457,124

Claims priority, application Germany, Apr. 4, 1973, 2322421

Int. Cl. F16k *17/00*

U.S. Cl. 137—488 **9 Claims**



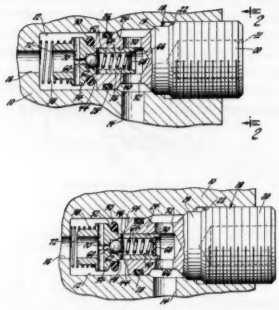
1. In a fluid flow regulating apparatus, a combination comprising a master valve having a body provided with a fluid admitting inlet opening and a fluid discharging outlet opening, the pressure of fluid in one of said openings being variable, said master valve including further a valve member movable in said body between a plurality of positions to thereby change the rate of fluid flow between said openings and means for biasing said valve member in a first direction, said valve member having a first surface which is subjected to fluid pressure in said one opening so that the fluid in said one opening tends to move said valve member in a second direction counter said first direction, said biasing means including a plenum chamber and said valve member having a second surface which is subjected to the pressure of fluid in said chamber; first channel means connecting said one opening with said chamber; a tank; second channel means connecting said chamber with said tank; first adjustable flow restrictor means provided in said first channel means and comprising a portion which is movable between a plurality of positions to thereby change the rate of fluid flow in said first channel means; adjustable pilot valve means provided in said second channel means and comprising a portion which is movable between a plurality of positions including a closed position to thereby change the rate of fluid flow in said second channel means; and second flow restrictor means provided in said second channel means between said chamber and said pilot valve means, and comprising a first portion and a second portion movable with respect to said first portion to thereby change the rate of fluid flow through said second flow restrictor means, said second portion of said second flow restrictor mans being arranged to move said portion of said first flow restrictor means in response to movement of said portion of said pilot valve means and vice versa, said second flow restrictor means providing a maximum throttling action and said first flow restrictor means a minimum throttling action when said pilot valve means is in said closed position and said second portion of said second flow restrictor means being constructed and arranged to increase the throttling action of said first flow restrictor means at a first rate and simultaneously reduce the throttling action of said second flow restrictor means at a lower second rate when said pilot valve means moves away from said closed position in response to variations of fluid pressure in said one opening.

3,896,845

ACCUMULATOR CHARGING AND RELIEF VALVE

Donald L. Parker, Middletown, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 13, 1974, Ser. No. 479,035
Int. Cl. F16k *17/26*
U.S. Cl. 137—493.3 2 Claims



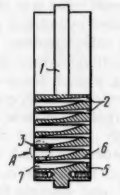
1. In a charging valve adapted to be removably attached to a brake booster housing for controlling the introduction of pressurized fluid to an accumulator, a valve body having an enlarged cylindrical head with a threaded portion adapted to be removably attached in a corresponding threaded bore in said housing, said valve body having an elongated end portion extending into a cavity in the brake booster housing between a first passage fluidly connected to a fluid pressure source and a second passage fluidly connected to an accumulator; annular seal means encircling said end portion and engaging the surrounding surface of the housing to prevent fluid communication therebetween; said end portion having passage means therein including an axially directed cylinder bore and a radially directed port connected to said first passage; a movable valve member having an elongated cylindrical portion extending into said bore for reciprocal movement therein, and having a passage including an axially directed portion fluidly connected to said first passage and a radially directed portion normally covered by the surrounding end of said valve body when in a closed operative position and moved with said movable valve member to an open operative position away from said end portion of said valve body to interconnect said first and second passages, said end portion of said movable valve member having a valve seat formed thereabout, a corresponding valve seat formed on the end of said valve body adapted to be engaged by the valve seat of the movable valve member when in a closed operative position thereby providing a primary metal-to-metal seal therebetween, a spring biasing said movable valve member toward its closed operative position with the valve seats engaged, an annular resilient seal member encircling said valve seats when in a closed operative position, inclined surfaces on said movable valve member and on said valve body contacting opposite sides of said seal member when in a closed operative position and thereby compressing portions of said seal member to provide a secondary seal about said primary metal-to-metal seal.

3,896,846

DIRECT-FLOW VALVE

Georgy Leonidovich Zakharzhevsky, ulitsa Chkalova 125, kv. 14, Sumy, U.S.S.R.

Filed May 14, 1973, Ser. No. 360,169
Claims priority, application U.S.S.R., Dec. 10, 1969, 1383604
Int. Cl. F16k *15/16*
U.S. Cl. 137—512.1 1 Claim



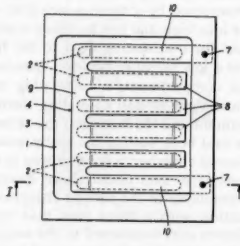
1. A direct-flow valve comprising: an integrally formed body; a system of slots made in said body on the delivery side narrowing toward the suction side and having bottom walls, one of the walls of said slots functioning as valve seats; rows of through openings made in said body on the suction side, said openings extending adjacent said walls of said narrowing slots, which function as the valve seats, flat resilient plates each having one of their edges fastened to the bottom portions of said slots so as to abut against said bottom walls of the slots so as to bias said plates into contact with said valve seats, said plates functioning as the valve members for respectively separating the cavities formed by said slots and said openings, said plates being deflected during the suction period from contact with said slot walls which function as the valve seats, and abutting against the opposite walls of said slots which function as members limiting the bending of said resilient plates.

3,896,847

LAMELLAR VALVES

Friedrich Bauer, and Hans Hrabal, both of Vienna, Austria, assignors to Hoerbiger Ventilwerke Aktiengesellschaft, Vienna, Austria

Filed Dec. 17, 1973, Ser. No. 425,349
Claims priority, application Austria, Dec. 22, 1972, 10971/72
Int. Cl.[2] F16K *15/16*
U.S. Cl. 137—512.15 4 Claims

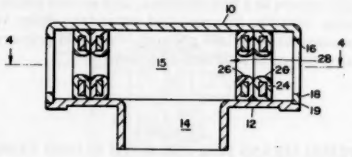


1. A lamellar valve for compressors, comprising: a seating plate with throughflow channels; a closure plate supported by flexible guide rods for covering said throughflow channels and including elastic tongues with free ends, said tongues being connected by a transverse joining web; and said flexible guide rods extending from the ends of said joining web and being clamped at locations spaced therefrom.

3,896,848
PRESSURE RESPONSIVE CHECK VALVE

James R. Sypitkowski, Clawson, Mich., assignor to The Carborundum Company, Niagara Falls, N.Y.

Division of Ser. No. 292,561, Sept. 27, 1972, Pat. No. 3,844,947. This application Mar. 25, 1974, Ser. No. 454,635
Int. Cl. F16k *15/14*
U.S. Cl. 137—512.15 6 Claims

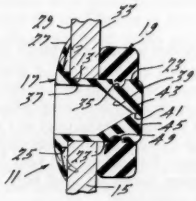


1. A fluid pressure responsive check valve wherein the improvement comprises: means forming a chamber having parallel inner surfaces connected by a side provided with one of an inlet and an outlet, the other of which communicates with one of said inner surfaces; and fluid pressure responsive sealing means disposed in said chamber and normally preventing fluid flow from said inlet to said outlet, said sealing means having sealing surfaces in sliding relationship with said inner surfaces and each other and being movable in response to fluid pressure exerted against said sealing means through said inlet to permit fluid flow to said outlet.

3,896,849
PRESSURE RELIEF VALVE

Paul R. Ervin, Milford, and George H. Muller, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 385,921, Aug. 6, 1973, abandoned, which is a division of Ser. No. 234,227, Feb. 13, 1972, abandoned. This application Aug. 5, 1974, Ser. No. 494,654
Int. Cl.[2] F16K *15/14*
U.S. Cl. 137—525.1 2 Claims

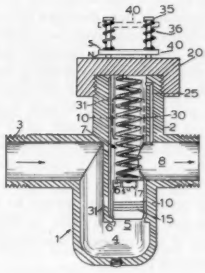


1. The combination of an elastomeric pressure relief valve and a relatively rigid fluid enclosure wall, said enclosure wall having a circular opening formed therein,
said valve including an elastomeric insert received within said opening,
said insert including a passage extending from the interior of said enclosure toward the exterior thereof and
closure means separating said passage from the exterior of said enclosure when the enclosure contains a fluid of a pressure less than a predetermined magnitude,
said closure means being elastically deformable to open said passage to the exterior of said enclosure when the pressure within the enclosue exceeds the predetermined magnitude,
said insert including a head having a cross sectional dimension greater than that of the opening in the wall of said enclosure,
resilient means positioned about said insert constricting said closure means to a more tightly closed position,
said resilient means comprising an elastomeric annulus,
said insert and said resilient means including annular groove means and cooperating annular bead means to retain said resilient means in a predetermined position about said insert,
said elastomeric annulus when in position about said insert being engaged with the exterior of the enclosure wall adjacent said opening, said insert head and said elastomeric annulus sandwiching the enclosure wall to retain said insert in position within said opening.

3,896,850
CHECK VALVE AND LEAK INDICATOR

Hobart Waltrip, 3444 Bonnie Lea Ct., Louisville, Ky. 40216

Filed July 16, 1973, Ser. No. 379,803
Int. Cl. F16k *21/04*
U.S. Cl. 137—554 1 Claim

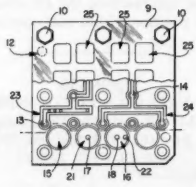


1. A high pressure steam valve including
A. a valve body comprising:
1. an elongated valve chamber, including:
a. an inlet port at one end of said chamber,
1. an annular valve seat surrounding said inlet port
b. an outlet port opening in the side wall of said valve chamber at a point in spaced relation to said inlet port and extending through the side wall of said valve body,
B. an elongated valve closure in the form of a cylindrical plug, and a circular compression ring surrounding said cylindrical plug, said cylindrical plug being fitted in said valve chamber for axial reciprocating movement in said chamber between
1. full closed position seated against said annular valve seat
2. full open position at a point past said outlet port,
3. a leaking position wherein said compression ring surrounding said cylindrical plug is past the level of the lowest part of said outlet port thereby allowing a small leak to occur, and at
4. intermediate points therebetween
C. a spring, mounted in said valve chamber and biased at the top against the top of said valve chamber and at the bottom against said cylindrical plug for urging said cylindrical plug toward said full closed position,
D. the further combination therewith of indicator means responsive to the axial movement of said cylindrical plug to indicate the position of said cylindrical plug and visibly indicate the position of said cylindrical plug at said leaking position.

3,896,851
INTEGRATED MODULAR FLUID LOGIC ARRAYS DISPLAYING DYNAMIC CIRCUIT OPERATING CONDITIONS

Charles William Brouwer, East Greenwich, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed Jan. 28, 1974, Ser. No. 436,941
Int. Cl.[2] G06D *1/12*
U.S. Cl. 137—557 **10 Claims**

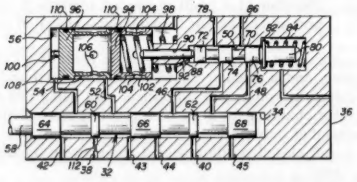


1. A fluid logic system comprising in combination, a plurality of fluid logic elements of the flexible diaphragm type laid out in a modular circuit sandwich array with a common elastically deformable diaphragm held between two opposed apertured logic plates defining respectively two mating cavity wells for each of said logic elements on opposite sides of the diaphragm and with said logic plates holding said diaphragm tautly therebetween, a manifold plate defining a plurality of fluid flow paths for conveying fluid to said wells of the logic elements disposed on the opposite side of at least one said logic plate and including a display plate disposed as an outer element in said sandwich array for visual observation, said display plate comprising a plurality of pressure indicators each connected by a fluid conveying passageway to a different one of the fluid paths on said manifold plate, to thereby present a set of visible indicia of the pressure conditions of predetermined circuit monitoring points.

3,896,852
TIME DELAY VALVE

Lloyd H. Holmes, Salt Lake City, Utah, assignor to E-Systems, Inc., Dallas, Tex.

Filed Dec. 6, 1973, Ser. No. 422,332
Int. Cl. F15b *13/042, 21/10*
U.S. Cl. 137—596.18 **9 Claims**



4. A time delay mechanism for controlling a fluid flow in a fluid control system, comprising in combination:

a secondary slider valve movable between an open position and a closed position for controlling a fluid flow from input lines to output lines as part of the fluid control system;

actuator means responsive to a fluid pressure for activating said slider valve to move from the closed position to the open position;

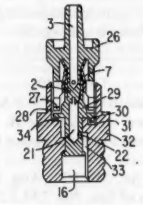
a selectively operable primary slider valve for controlling a fluid flow to the input lines of the secondary slider valve from a fluid source and also for controlling a fluid flow to said actuator means from the fluid source; and

means defining an orifice in a line from the source to said actuator means to establish a time delay between the movement of the primary slider valve and the movement of the secondary slider valve, said actuator means further comprising first and second piston means, said first piston means being independently movable with respect to said second distinct piston means, said first piston means being movable to open said secondary slider valve in response to said fluid pressure when said primary slider valve moves in a first direction, said second piston means being movable to open said secondary slider valve in response to said fluid pressure when said primary slider valve moves in a second direction.

3,896,853
COUPLING MEANS FOR USE WITH BLOOD SAMPLING APPARATUS

Johann Bernhard, Nacka, Sweden, assignor to Pro Medical Engineering AB, Lidingo, Sweden

Division of Ser. No. 270,312, July 10, 1972, Pat. No. 3,838,843. This application July 23, 1974, Ser. No. 490,982
Int. Cl. F16l *37/28*; A61b *5/14*
U.S. Cl. 137—614.05 **7 Claims**



1. A coupling device for use with blood sampling apparatus comprising a needle carrier portion, a junction portion, and means for fitting said portions to one another into an operative unit, said needle carrier portion comprising:

a. valve means having an axial duct and a vent hole,

b. a resilient valve sleeve surrounding said valve means, and including means for sealing said vent hole,

said junction portion having an axial bore open at the lower end thereof, and comprising:

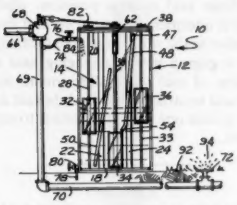
1. a junction sleeve disposed in said bore, means for turning the junction sleeve in the bore of the junction portion to a first position, said junction sleeve having an axial duct and a lateral hole,
2. means associated with the needle carrier portion and the junction sleeve for fitting one to another, said last means enabling the turning of the needle carrier portion and the junction sleeve as one unit relative to the junction portion for closing said lateral hole,
3. said junction sleeve having an orifice portion at the upper end of said axial duct,
4. said orifice portion being slightly wider than said valve means, and
5. said junction sleeve being removably coupled to said valve means,

whereby in connecting the two portions of the device no air is forced into the first portion by reason of the junction sleeve lifting part of the resilient valve sleeve thereby opening the vent hole to enable escape of air to the atmosphere.

3,896,854
MEANS FOR AUTOMATICALLY TIMING INTERMITTENT CYCLES OF LIQUID FLOW

James A. Utchell, 7749 Golondrina, San Bernardino, Calif. 92410

Filed Aug. 7, 1974, Ser. No. 495,324
Int. Cl. A01g 27/00
U.S. Cl. 137—624.14 10 Claims



1. Flow control means for quickly and automatically starting and stopping the flow of liquid, in accordance with a sequence of alternating flow and non-flow cycles of respectively equal duration, from a pressurized source through a valve fitted with a control lever adapted to maintain the valve in normally open position but movable in a way to close said valve, and into a conduit in downstream communication with the valve, said flow control means comprising:

a tank having a upper opening and a lower opening for the flow of said liquid into and out of the tank, respectively, said tank being connectable with said conduit in a way to receive a portion of the liquid flowing through said conduit through said upper opening by means including a first adjustable valve, said tank also being adapted to permit the attachment thereto of drainage means, including a second adjustable valve, in communication with said lower opening, whereby some of the liquid can be routed into said tank from said conduit and drained from the tank through said lower opening at desired flow rates, during operation of said flow control means, through appropriate adjustment of the first and second valves;

float means including three separate floats and guide means therefor adapted for installation in said tank so that the floats are confined to fixed paths of travel under the influence of changing liquid levels in the tank, said three separate floats including, in the installed flow control means, a first float, a second float disposed outwardly in one direction from the first float and a third float disposed outwardly in a second direction from said first float;

said float means including, additionally, first pivoted lever means and mounting means therefor adapted for normal disposition in the installed float means in a way to physically restrain said first float when the latter is at substantially its lowest point of travel in the tank and thereby hold the first float at that position, and being pivotally movable by said second float, when the latter arrives at substantially its highest point of travel in the tank, in a way to free the first float from its physical restraint and permit upward movement thereof;

said float means also including second pivoted lever means and mounting means therefor adapted for normal disposition in the installed float means in a way to physically restrain said first float when the latter is at substantially its highest point of travel in the tank and the reby hold the first float in that position, and being pivotally movable by said third float, when the latter descends to substantially its lowest point of travel in the tank, in a way to free the first float from its physical restraint and permit downward movement thereof;

the installed float means including valve actuating means adapted, when upward force is applied thereto, to move said control lever in a way to close said valve;

the valve actuating means and first float being adapted and relatively positioned in the installed float means so that said first float induces said valve actuating means to close said valve under the influence of upwardly exerted force thereon when the first float reaches substantialy its upper limit of travel within said tank;

whereby the operating flow control means serves to automatically effectuate alternating cycles of flow and nonflow of said liquid into said conduit from said pressurized source at fixed flow and nonflow time periods through adjustment of the first and second adjustable valves so that filling time of the tank from a fixed lower level to a fixed upper level, with the second adjustable, or drainage, valve open at its adjusted setting, corresponds to a predetermined time period cycle for flow of the liquid into said conduit, and drainage time of the tank from said fixed upper level to said fixed lower level corresponds to a predetermined time cycle period for nonflow of the liquid into said conduit;

and whereby, when the flow control means is operating, the second and third floats rise with the rising liquid level in said tank during the tank-filling cycle of operations while said first pivoted lever means holds said first float at its lowermost position of travel until said liquid level reaches said fixed upper level, whereat said second float causes the first pivoted lever means to move and free said first float for upward travel, which float then bobs rapidly upwardly through the liquid to its uppermost position of travel and causes the valve actuating means to rapidly close the valve and thereby terminate said tank-filling cycle of operations, after which the second pivoted lever means assumes its normal position and holds said first float at said uppermost position whereat that float maintains said valve closed, by the steady application of upwardly directed force to said valve actuating means, so that the liquid drains from the tank through said adjustable second valve and the second and third float descend with the falling liquid level in the tank until said fixed lower level is reached, whereat the third float forces said second lever means to move and thereby free the first float for descent, which latter then drops rapidly out of contact with said valve actuating means to the cushioning liquid at said fixed lower level and permits the valve actuating means to allow the control lever to move in a way to quickly open said valve and recommence the tank-filling cycle of operations.

3,896,855
MULTIPORTED VALVE

Cecil C. Grieger, Houston; Roy W. Benefield, Magnolia; Alton D. Oliver, and Clyde H. Chronister, both of Houston, all of Tex., assignors to Chronister Development, Inc., Houston, Tex.

Filed Mar. 12, 1974, Ser. No. 450,302
Int. Cl.[2] F16K 11/02
U.S. Cl. 137—625.11 4 Claims

1. A multiported valve comprising,

a housing having first, second and third conduits extending therein,

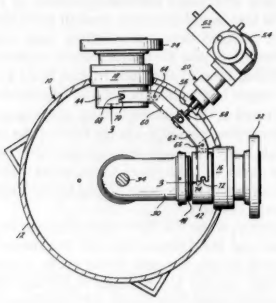
a pipe bend in said housing having first and second ends, the first end thereof being pivotally sealable to the first conduit,

means connected to the bend and extending outside of said housing for rotating said bend about the first end for moving the second end into and out of alignment with the second and third conduits,

a movable collar positioned in said housing and telescopically and sealably engaging each of the second and third conduits for telescopically engaging and sealing with the second end of the pipe bend when the second end is aligned with one of the second and third conduits, and

means connected to both of said collars and actuated exteriorly of the housing for simultaneously retracting said

collars allowing the second end of the bend to be moved between the second and third conduits, and extending the collars to bring the collars into engagement with the second end of the bend when the second end is aligned with one of the second and third conduits, said means connected to said collars including,



first and second levers in the housing, one end of each of the levers connected to one of the collars,

said levers pivotally connected to the housing,

a single actuator actuated exteriorly of the housing and connected to the second ends of the first and second levers for axially moving both of the collars.

3,896,856

DAMPED CONSUMER VALVE ARRANGEMENT

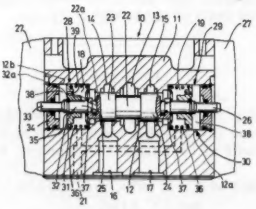
Werner Schumacher, Asperg, and Eugen Mayr, Stuttgart, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Aug. 8, 1973, Ser. No. 386,738

Claims priority, application Germany, Sept. 11, 1972, 2244493

Int. Cl.² F16K *31/02, 11/00*

U.S. Cl. 137—625.65 **6 Claims**



1. Damped consumer valve arrangement comprising a valve body having a bore and including supply conduit means, consumer conduit means, and return conduit means communicating with a supply bore portion, first and second consumer bore portions, and first and second return bore portions of said bore, respectively; valve means movable in said bore between a neutral position, and first and second operative positions for connecting in said first operative position said supply bore portion with said first consumer bore portion and said second consumer bore portion with said second return bore portion and for connecting in said second operative position said supply bore portion with said second consumer bore portion and said first consumer bore portion with said first return bore portion; damping means arranged in at least one of said return bore portions and including spring means, a damping piston movably mounted on said valve slide means and engaging one end of said spring means, and an annular spring washer also movably mounted on said valve slide means and engaging the other end of said spring means; first stationary abutment means on one end of said at least one return bore portion, and second stationary abutment means on the opposite end of said at least one return bore portion, said damping piston being spaced from said first abutment means and said spring washer engaging said second abutment means in said neutral position of said valve slide means; and a pair of engaging means on said valve slide means, one of said engaging means engaging said damping piston during movement of said valve slide means in one direction from said neutral position, while said spring washer remains in abutment with said second abutment means and moves relative to the other of said pair of engaging means, and the other engaging means engaging said spring washer during movement of said valve slide means in the opposite direction from said neutral position, while said damping piston moves relative to said one engaging means to engage said first abutment means.

3,896,857

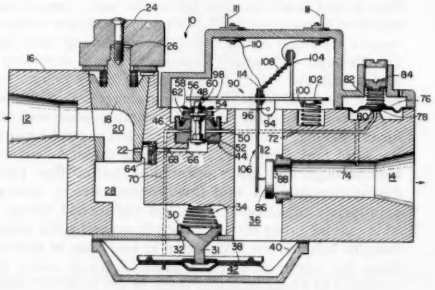
CONTROL DEVICE HAVING A BLEED VALVE AND AN AUTOMATIC VALVE OPERATED SEQUENTIALLY BY A SINGLE BIMETAL ELEMENT

Jess H. Turner, Riverside; Elmer E. Wallace, Fullerton, and Frank Fiedler, Jr., Rowland Heights, all of Calif., assignors to Essex International, Inc., Fort Wayne, Ind.

Filed Feb. 20, 1974, Ser. No. 444,092

Int. Cl.² F16K *31/42;* **G05D** *23/185*

U.S. Cl. 137—628 **6 Claims**



1. A control device for controlling the flow of fuel to a burner apparatus, comprising:

a casing having inlet and outlet means;

a differential pressure operated diaphragm mounted in said casing and defining an operating pressure chamber between a portion of said casing and said diaphragm;

main valve means operatively connected to said diaphragm for controlling the flow of fuel between said inlet and said outlet means;

a bleed flow path communicating with said inlet and said outlet means and said operating pressure chamber;

a bleed valve means situated in said bleed flowpath for causing operation of said main valve means when actuated;

a bleed valve actuating member pivotally mounted in said casing, said bleed valve actuating member having a portion adapted to actuate said bleed valve means;

first biasing means for normally urging said bleed valve actuating member to a bleed valve actuating position;

an automatic valve means for controlling fuel flow from said main valve means to said outlet means; and

thermally responsive means connected to said bleed valve actuating member and said automatic valve means for operating said bleed valve means and said automatic valve means sequentially.

3,896,858

UTILITY POLE

William J. Whatley, 631 S. Pontiac St., Denver, Colo. 80222

Filed Feb. 28, 1973, Ser. No. 336,724
Int. Cl. F16l *11/02*
U.S. Cl. 138—130 6 Claims

1. A hollow tapered pole comprising:

an inner core section tapered inwardly toward the upper end and made up of a plurality of layers of glass filaments treated with a bonding resin, the filaments of each layer being arranged at an angle to the longitudinal axis of the pole from about 65° to 85° with alternate of said layers crossing one another in opposite directions; and

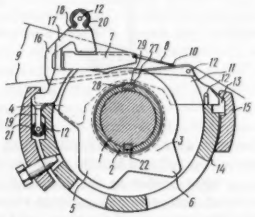
an outer cover section wrapped on said inner core section made up of bands of filaments treated with a bonding resin, the bands of filaments being continuous between the ends of the pole and arranged at an angle to the longitudinal axis of the pole from about 3 degrees to 15° with alternate bonds crossing each other in opposite directions, the weight of the outer cover section being from about 55 percent to 85 percent of the entire weight of the pole.

3,896,859

REED STRUCTURE FOR PROGRESSIVE SHEDDING LOOMS

Dmitry Vladimirovich Titov, 13 Parkovaya ulitsa, 27, korpus 2, kv. 49, Moscow, U.S.S.R.

Filed Feb. 4, 1974, Ser. No. 439,613
Claims priority, application U.S.S.R., Feb. 9, 1973, 1880958
Int. Cl. D03d *47/26*
U.S. Cl. 139—12 5 Claims



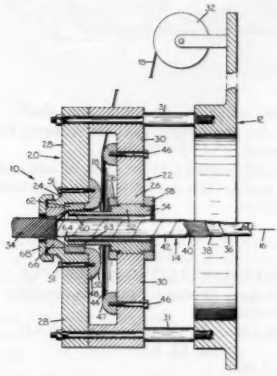
1. A reed structure for a progressive shedding loom, comprising a drive shaft; key means associated with said drive shaft; a plurality of bosses received about said drive shaft and connected each with said shaft by said key means, said bosses snugly fitted together throughout the length of said shaft to define a substantially continuous peripheral surface identical to the surface of said shaft; a plurality of discs having teeth adapted for cooperation with weft thread carriers, said discs being mounted on said bosses in a successively angularly staggered relationship, so that said teeth thereof form a helical surface and are adapted to beat up a weft thread to the fell of the cloth being woven.

3,896,860

ASSEMBLY FOR PREFORMING WIRE DURING HELICAL WINDING

Vincent A. Iannucci, West Lawn, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 13, 1974, Ser. No. 450,930
Int. Cl.[2] B65H *81/08*
U.S. Cl. 140—149 15 Claims



1. A preforming assembly for preforming wire being wound on an elongated member, said wire being supplied from a source being relatively rotated about and relatively displaced along the longitudinal axis of said elongated member to cause said wire to be wound on said elongated member in a helical shape, said preforming assembly comprising:

means for guiding said wire around an outside surface of a cylindrical tube which is coaxially aligned with said elongated member and has a diameter greater than the diameter of said helical shape to cause said wire to slide along said outside surface through a substantially helical path, and

means for bending said wire toward said elongated member as it leaves said helical path and said outside surface of said cylindrical tube through a curved path having a radius less than the effective radius of said helical shape.

3,896,861

AUXILIARY TOOL ADAPTER FOR ELECTRIC HAND SAWS HAVING FORWARDLY MOUNTED AUXILIARY HANDLES

Clarence J. Heisler, 28007 S Dr., North, R.R. No. 2, Springport, Mich. 49284

Continuation-in-part of Ser. No. 107,292, Jan. 18, 1971. This application Apr. 30, 1973, Ser. No. 356 ,050. The portion of the term of this patent subsequent to July 24, 1990, has been disclaimed.
Int. Cl. B27e *9/2*
U.S. Cl. 144—1 E 11 Claims

1. A hand-held electric power-operated circular saw adapted to be utilized for operating power tool attachments comprising:

a. an integral base,

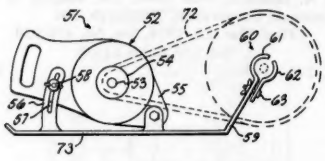
b. a motor mounted on said base having a rotatable shaft,

c. a handle mounted on said saw,

d. mandrel supporting means comprising an integral extension of said base directed upwardly therefrom and termi-

nating in a mandrel-engaging recess, and means adjustably mounted on said mandrel supporting means cooperating with said mandrel-engaging recess to engage and support a mandrel,

e. a mandrel mounted in said mandrel engaging recess and secured by said means adjustably mounted on said mandrel supporting means and having a shaft rotatably journaled therein,



f. a first pulley mounted on said mandrel shaft,

g. means at the end of said shaft for securing tool attachments thereto,

h. a second pulley affixed to the shaft of said motor, and

i. a flexible endless belt operatively coupling said first and second pulleys.

3,896,862

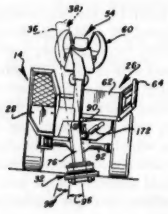
TREE HARVESTING APPARATUS

Robert N. Windsor, Brisbane, Australia, assignor to Eaton Yale Ltd., Canada

Filed Mar. 7, 1974, Ser. No. 449,045

Int. Cl. B27c *9/00*

U.S. Cl. 144—3 D **15 Claims**



1. An apparatus for use in harvesting trees, said apparatus comprising a base, delimbing means connected with said base for delimbing a felled tree, said delimbing means extending longitudinally with respect to said base, felling head means for clamping and severing the trunk of a standing tree, articulated boom means connected with said felling head means for moving said felling head means relative to said delimbing means, means for supporting said articulated boom means for pivotal movement relative to said base about a first axis longitudinally oriented with respect to said base, and first motor means for pivoting said articulated boom means about said first axis.

3,896,863

DEBARKING METHOD AND APPARATUS

Ralmond J. Smiltneek, 12906 W. Fairmount Ave., Butler, Wis. 53007

Filed July 3, 1974, Ser. No. 485,500

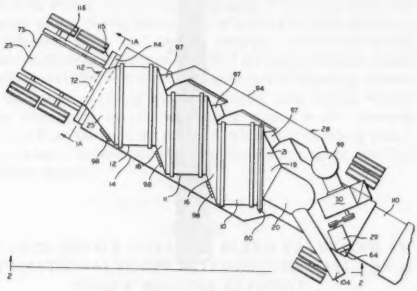
Int. Cl. B27l *1/00*

U.S. Cl. 144—311 **26 Claims**

18. A method of removing undesirable material from wood sections comprising the steps of:

providing a plurality of interconnected impact zones, placing in the first of said impact zones a plurality of unconnected impact means having higher specific gravity than the wood sections to be debarked, introducing into a first impact zone at least one of said wood sections,

rotating each of said impact zones for continuously separating said impact means and said wood sections and randomly moving said plurality of impact means relative to said wood sections and into impacting engagement therewith,



moving said wood sections and impact means successively through each of said zones while rotating the same to randomly move the impact means relative to the wood sections and into impacting engagement therewith,

removing the wood sections and impact means from the last of said zones, recycling said impact means to the first of said zones,

and introducing additional wood sections into the first of said zones.

3,896,864

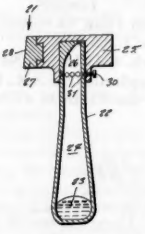
TIRE HAMMER

Frank D. Green, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Jan. 15, 1974, Ser. No. 433,514

Int. Cl. B25d *1/00*

U.S. Cl. 145—36 **2 Claims**



1. A tire hammer, comprising a handle and a head mounted removably on one end of said handle, wherein the long axis of said head is at right angles to the longitudinal axis of the handle, said head comprising a contact member rotatably mounted about the long axis of the head, said member having an external face inclined relative to the handle axis whereby rotation of said member will vary the orientation of the inclination relative to the handle axis, wherein the member has a wedge shaped projection fitted in a receiving bore in the head and wherein the handle is hollow with means for increasing the impact shock at the face upon delivering a blow, said means including an inclined interior surface and a freely moving weight in said handle which impinges on the interior surface upon impact.

3,896,865
PROPELLANT WITH POLYMER CONTAINING NITRAMINE MOIETIES AS BINDER

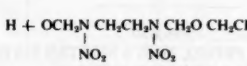
Theodore F. Comfort, Cumberland, Md.; Richard J. Legare, Salt Lake City, Utah, and Ronald Rosher, Cumberland, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 219,183, Jan. 19, 1972, Pat. No. 3,808,276. This application Jan. 21, 1974, Ser. No. 435,073

Int. Cl.[2] C06D *5/06*

U.S. Cl. 149—19.4 **13 Claims**

1. A solid propellant composition which contains a cured polymer as a binder component therefor, said polymer being of the formula:



$$H + OCH_2N\,CH_2CH_2N\,CH_2O\,CH_2CH_2 \rightarrow_3 OH.$$
$$\quad\quad\quad NO_2 \quad\quad\quad NO_2$$

3,896,866
SHEATH FOR UMBRELLA

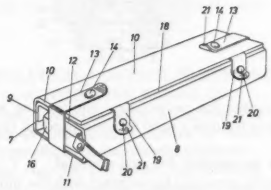
Hans Hoffmann, Essen, Germany, assignor to Telesco Brophey Limited, Montreal, Canada

Filed Sept. 26, 1972, Ser. No. 292,347

Claims priority, application Germany, Sept. 29, 1971, 2148472

Int. Cl.[2] B65B *11/00*

U.S. Cl. 150—52 R **2 Claims**



1. A wrap-around, umbrella sheath in combination with a foldable-flat collapsed umbrella, said sheath comprising a single, rectangular blank having a length and width, a plurality of linear hinge portions extending the length of said blank and defining six adjacent rectangular panels therealong, detachable fastening means on said blank assembling and retaining said blank as a tubular sheath having a rectangular cross-section in circumposed relation about the collapsed umbrella with at least two of the six panels respectively in juxtaposed relation with two others of the panels for rigidifying and substantially maintaining the rectangular cross-Section of the sheath in wrapped relation about the collapsed, foldable-flat umbrella, said detachable fastening means for assembling said blank comprising strap elements anchored at one end to respective opposite ends of the sheath and extending transversely across open ends of the rectangular sheath retaining the collapsed umbrella therein and including means detachably connecting the straps to an opposite side of the rectangular sheath, the straps preventing the folded umbrella from movement out of the rectangular sheath and retaining the folded sheath in a rigid, rectangular assembled relation, said strap elements being narrower in width than the open ends of the rectangular sheath and exposing the ends of the collapsed umbrella, said umbrella including a carrying-strap projecting from and accessible between one of the detachable fastening means straps and the inner surface of one panel of the rectangular sheath.

3,896,867
FASTENER FOR PANELS

Peter John Gill, and Dennis Joseph O'Donnell, both of Walsall, England, assignors to G.K.N. Screws & Fasteners Limited, England

Filed June 8, 1973, Ser. No. 368,317

Claims priority, application United Kingdom, June 8, 1972, 26711/72

Int. Cl. F16b *39/286, 43/00*

U.S. Cl. 151—69 **2 Claims**

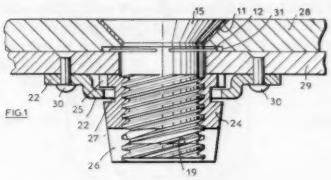


FIG.1

1. A quick operating fastener for securing two panels in face to face relationship comprising a stud sub-assembly for captive mounting on one panel, and a complementary nut subassembly for captive mounting on the other panel, wherein said nut sub-assembly comprises:

a yoke having a pair of spaced apart attachment lugs for securing it to such other panel, and a part extending between said lugs and having an opening therethrough bounded by a pair of opposed flanges; and

an internally threaded sleeve having at one end a radially extending noncircular flange with a transverse dimension greater than the spacing between said opposed flanges of said yoke, the wall of said sleeve being provided with at least one slit extending from the other end thereof at least part of the way to the one end thereof, said sleeve having a reduced internal diameter at the other end thereof to cause said sleeve to act as a self-locking nut, said sleeve being provided with a cylindrical groove adjacent said noncircular flange and defining an annular shoulder facing toward said noncircular flange and having a diameter greater than that of said opening;

said sleeve being retained captive in said yoke with said annular shoulder and said noncircular flange engaging loosely on opposite sides of said opening, the outer surface of said sleeve, adjacent said annular shoulder, being tapered inwardly away from said annular shoulder to permit said sleeve to be sprung through said opening, and said noncircular flange being prevented from rotation by virtue of its engagement between said attachment lugs;

and said stud sub-assembly comprises:

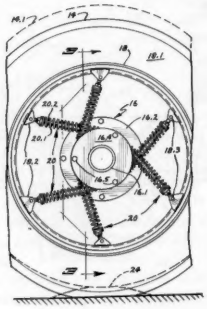
an externally threaded shank having a head at one end and provided with a multi-start thread of high helix angle and of trapezoidal form extending to the other end of said shank, said thread having a reduced portion close to, but spaced from, said other end of said shank, said reduced portion having a diameter less than the thread major diameter and tapering inwardly away from said head, with said shank presenting an abutment shoulder bordering the smaller diameter end of said reduced portion and extending radially outwardly therefrom; and

a resilient spring retaining washer on said stud shank between said head and said abutment shoulder, the inner diameter of said washer in its untensioned state, being less than the diameter of said abutment shoulder, whereby said washer can close into said reduced portion of said shank and retain said stud in place in a hole in the one panel.

3,896,868
RESILIENTLY MOUNTED AUXILIARY WHEEL FOR A TRACTOR

Ambrose Leo Molitor, 530 N. Elm St., Sauk Center, Minn. 56378

Filed Jan. 17, 1974, Ser. No. 434,245
Int. Cl. B60b *1/06*
U.S. Cl. 152—13 10 Claims

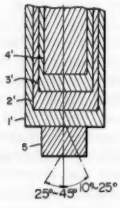


1. Resiliently mounted auxiliary wheel for mounting exteriorly of a tractor wheel and comprising a hub axially connectable to the hub of a tractor tire, a rim upon which is mounted an auxiliary tire, and a plurality of elongated, elastically compressible supports held in compression between the hub and the rim, each support being mounted at one end to the rim and at the other end to the hub and spaced axially along the hub with respect to another support, each support being oriented with respect to the hub to exert force on the hub tangentially of the hub axis, the supports being separated into pairs of coacting parallel supports, the pairs being equally spaced about the circumference of the rim and each support pair being interleaved with another support pair, the supports being oriented with respect to each other to collectively exert a balanced compressive force radially inwardly of the hub and along the axis of the hub to elastically retain the hub coaxially of the rim and permit the hub to elastically deviate from its coaxial orientation, as when the auxiliary tire is displaced with respect to a tractor tire by striking a rock or the like.

3,896,869
RADIAL PNEUMATIC TIRE HAVING A COMPENSATING CORD LAYER

Hiroyasu Fujishima; Kensei Aoe, and Masahiro Ishigaki, all of Ibaraki, Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 133,025, April 12, 1971, abandoned. This application Nov. 15, 1973, Ser. No. 416,307
Claims priority, application Japan, Apr. 13, 1970, 45-31698
Int. Cl. B60c *9/18*
U.S. Cl. 152—361 DM 3 Claims

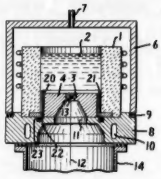


1. A pneumatic tire having a tread comprising a carcass having at least one rubber-coated cord layer intersecting the equator line of the tire at an angle of 60° to 90°, two rubber-coated inextensible belt cord layers adjacent to the carcass and beneath the tire tread intersecting the equator line of the tire at an angle of 15° to 35° and arranged symmetrically with respect to the equator line of the tire in opposite directions with respect to each other, and means for compensating for lateral deviating forces including a single additional rubber-coated low extensible cord layer interposed between said carcass and said inextensible belt cord layers, said additional layer intersecting the equator line of the tire at an angle of 10° to 30° and at an opposite direction to the adjacent layer of said inextensible belt cord layers, and said angle of said additional layer is at least 5° smaller than said angle of said inextensible belt cord layers.

3,896,870
APPARATUS FOR PROJECTING A MOLTEN MATERIAL INTO A COOLING MEDIUM

Jean Marie Massoubre, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand, France

Filed June 25, 1974, Ser. No. 483,008
Int. Cl. C21c *7/00*
U.S. Cl. 164—281 17 Claims



1. Apparatus for projecting a molten raw material into a cooling fluid to form a solid finished product therein, comprising

a crucible for holding the raw material,

nozzle means mounted for contact with the molten raw material in the crucible,

a pressurization enclosure for maintaining the raw material in the crucible under pressure,

gasket means formed of a material which is gas-tight and compatible with the molten raw material mounted for contact with the raw material and having a portion extending away therefrom,

the raw material facilitating a hot seal between (a) the portion of the gasket means in contact therewith and (b) the crucible and nozzle means, and

means facilitating a cold seal between (a) the portion of the gasket means extending away from the raw material and (b) the pressurization enclosure.

3,896,871
COMPUTER CONTROLLED AUTOMATED BUILDING SYSTEM HAVING A MANUAL CONTROL MODE

Joseph K. Pecoraro, Buffalo Grove; Philip A. Deckowitz, Des Plaines, and Norman E. Brunner, Barrington, all of Ill., assignors to Powers Regulator Company, Skokie, Ill.

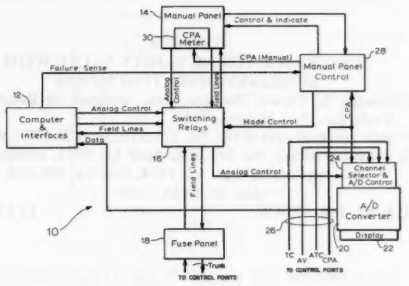
Filed Jan. 23, 1973, Ser. No. 325,973
Int. Cl. G05d *23/22*; F24f *11/00*; G05b *11/32*
U.S. Cl. 165—22 15 Claims

1. An automated building system for controlling the environmental conditions in a building comprising:

a plurality of control points, said control points having environmental conditioning equipment for maintaining environmental conditions at a desired level in a building and data sensors for sensing environmental conditions associated therewith;

a computer for generating control signals to operate environmental conditioning equipment associated with said control points and for receiving data from said control points;

manual control means for generating control signals to operate environmental conditioning equipment associated with said control points and to obtain data from said control points;



switching means for receiving control signals generated by said computer and control signals generated by said manual control means, said control points being coupled to said switching means, said switching means transferring control signals from said computer to said control points in a computer mode and transferring control signals from said manual control means in a manual mode.

3,896,872

TEMPERATURE-CONTROL SYSTEM FOR AUTOMOTIVE VEHICLES

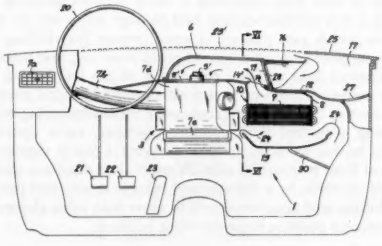
Hans Georg Pabst, Gaimersheim, and Siegfried Mildner, Affalterbach, both of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Ingolstadt, Germany

Filed Oct. 29, 1973, Ser. No. 410,318

Claims priority, application Germany, Oct. 27, 1972, 2252706

Int. Cl. B61d *27/00*

U.S. Cl. 165—42 **8 Claims**



1. A temperature-control system for the interior of an automotive vehicle, comprising:

an air-circulation structure having an upstream section and a downstream section, said structure forming a channel with an entrance end at said upstream section, an exit end at said downstream section and an intake port at an intermediate location between said sections, said entrance and exit ends being open to the interior of the vehicle, said intake port being open to the surrounding atmosphere;

a blower in said downstream section for generating an air stream in said channel;

an air cooler in said upstream section traversed by at least a portion of said air stream;

an air heater in said downstream section traversed by said air stream; and

flow-control means on said structure at said intermediate location for selectively varying the proportion of ambient and recirculated air admitted into said channel through said intake port and through said entrance end, respectively.

3,896,873

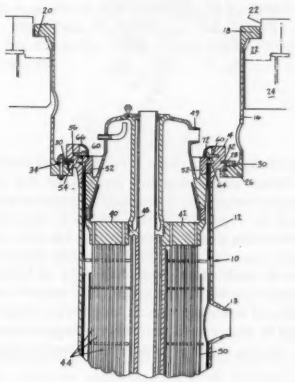
HEAT EXCHANGER WITH A REMOVABLE TUBE SECTION

Walter Wolowodiuk, New Providence, and John Anelli, Parsippany, both of N.J., assignors to The United States of America as represented by the United States Atomic Energy Commission, Richland, Wash.

Filed May 1, 1972, Ser. No. 248,922

Int. Cl. F28b *7/00*

U.S. Cl. 165—76 **5 Claims**



1. A heat exchanger comprising:

an outer shell of circular cross-section;

a fluid inlet in said outer shell;

a fluid outlet in said outer shell below said fluid inlet;

an annular slot extending around the inside of said shell adjacent to the top of said shell;

an inner core positioned within said shell, said inner core comprising a tube sheet, a plurality of tubes extending down from said tube sheet so that fluid from said inlet flows over the outside of said tubes and out through said outlet, and an annular bearing surface immovable with respect to said tube sheet, facing upward and disposed adjacent to said slot; and

a plurality of shear blocks disposed in a circle with a portion of each block engaging said bearing surface and a portion of each block extending into said slot and the inner edges of said blocks being free of engagement with any structure so that each of said blocks can be moved inward and out of said slot;

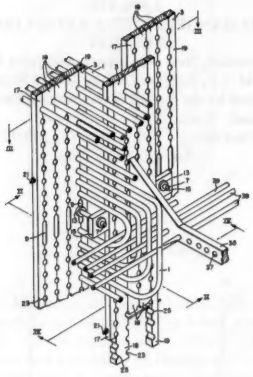
whereby said shear blocks prevent said inner core from moving upward but can be moved inward and out of engagement with said slot so that said inner core can be lifted out of said shell.

3,896,874

SUPPORT SYSTEM FOR SERPENTINE TUBES OF A HEAT EXCHANGER

Donald J. Bongaards, Seminole, Fla., and A. Robert Giardina, Broomall, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 31, 1972, Ser. No. 240,145
Int. Cl. F28d 7/00; F28f 9/00
U.S. Cl. 165—82 4 Claims



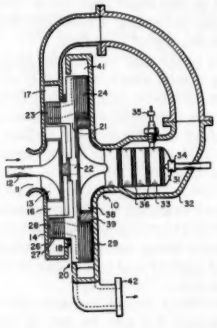
1. A heat exchanger having a tube bundle of closely packed serpentine tubes and a support system for the tubes, said support system comprising a plurality of support strips, which are disposed to repeatedly support each serpentine tube, means for fastening each support strip to an adjacent support strip in such a manner that the strips can only move lengthwise with respect to each other, and a plurality of lateral support sheets disposed normal to the strips, said support sheets having a plurality of openings spaced lengthwise along the sheet, the openings in adjacent support sheets registering and being adapted to receive a spacer which fits between adjacent rows of tubes.

3,896,875

HEAT EXCHANGER FOR GAS TURBINE ENGINES

Stephen R. Bolger, 920 S. Aiken Ave., Pittsburgh, Pa. 15232

Filed May 14, 1973, Ser. No. 359,968
Int. Cl. F28d 11/00
U.S. Cl. 165—86 15 Claims



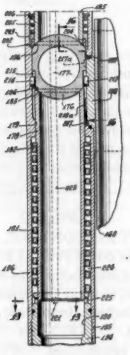
1. A heat exchanger for gas turbine engines comprising: a first and second matrix mounted for rotation about a main shaft of said turbine, said first matrix being in contact with gas from the compressor of said turbine and said second matrix in contact with exhaust gas, each of said matrices including a plurality of passageways for passage therethrough of the respective contacting gases, and at least one fluid chamber, said fluid chamber being in communication with an associated chamber of the other matrix and having a thermal transfer fluid contained therein vaporizable at below exhaust gas temperature.

3,896,876

SUBSURFACE TUBING SAFETY VALVE WITH AUXILIARY OPERATING MEANS

Talmadge L. Crowe, Houston, Tex., assignor to Baker Oil Tools, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 275,910, July 28, 1972, which is a division of Ser. No. 243,806, April 13, 1972, abandoned. This application Sept. 12, 1974, Ser. No. 505,348
Int. Cl. E21b 33/00
U.S. Cl. 166—224 A 17 Claims



1. In a shutoff valve for wells, said valve including an elongated valve body having a flow passage therethrough, valve means in said body including a valve element shiftable between a first position closing said passage and a second position at which said passage is open, means for shifting said valve member from said second position to said first position, and control fluid pressure responsive means for shifting said valve member from said first position to said second position, said control fluid pressure responsive means including means defining a control fluid pressure chamber, valve operating means having an actuator sleeve having a piston exposed to control fluid pressure in said chamber, and auxiliary shifting means operable by a shifting tool moveable into said passage for shifting said actuator sleeve to move said valve element to said second position from said first position.

3,896,877

METHOD OF SCHEDULING PROPPING MATERIAL IN HYDRAULIC FRACTURING TREATMENT

Thomas C. Vogt, Jr., Duncanville, and John L. Fitch, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York City, N.Y.

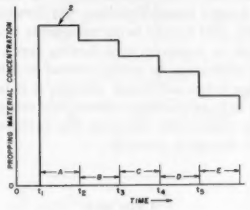
Filed Jan. 28, 1974, Ser. No. 437,106
Int. Cl.[2] E21B 43/26
U.S. Cl. 166—250 6 Claims

1. A hydraulic fracturing technique for generating a vertical fracture in a subterranean formation that is penetrated by a

well wherein a fracturing fluid containing propping material is injected into said formation, comprising the steps of:

a. determining the initial proppable fracture volume that is generated per initial incremental volume of fracturing fluid injected into said formation as a function of time;

b. determining the initial amount of propping material that is required to fill said initial proppable fracture volume to a height of at least 60 percent of the height of said vertical fracture;



c. iterating steps (a) and (b) for the time required to complete said hydraulic fracturing technique to determine as a function of time the amount of propping material required to fill said vertical fracture to a height of at least 60 percent of the height of said vertical fracture; and

d. scheduling the propping material concentration of said fracturing fluid in accordance with the determinations of steps (a), (b), and (c).

3,896,878

APPARATUS FOR ELECTROSLAG SMELTING OF SHAPED INGOTS

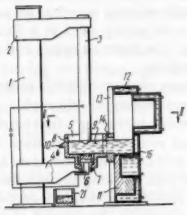
Boris Izrailevich Medovar, Bulvar Lesi Ukrainki, 2, kv. 8; Rudolf Solomonovich Dubinsky, Politekhnicheskaya ulitsa 5, kv. 209; Georgy Alexandrovich Boiko, ulitsa Vladimiro-Lybedskaya, 16, kv. 106; Georgy Sergeevich Marinsky, ulitsa Tatarskaya 1, kv. 19, and Sergei Petrovich Egorov, ulitsa Nevskaya 34, kv. 1, all of Kiev, U.S.S.R.

Continuation of Ser. No. 301,509, Oct. 27, 1972, abandoned. This application Mar. 5, 1974, Ser. No. 448,224

Claims priority, application U.S.S.R., Jan. 13, 1972, 17323522

Int. Cl. B22d *27/02*

U.S. Cl. 164—252 **3 Claims**



1. An apparatus for electroslag melting of shaped ingots comprising: a split cooled mould with a longitudinal slot formed in a side wall thereof; a slide mounted in said slot of said split cooled mould; a smelting vessel rigidly secured to said slide and communicated through the latter with said split cooled mould; a non-consumable electrode electrically insulated from said smelting vessel mounted in the hearth of said smelting vessel; a gauge for determining the level of liquid metal mounted on such slide in said split cooled mould; and drive means for moving said slide with said smelting vessel in a vertical direction.

3,896,879

STIMULATION OF RECOVERY FROM UNDERGROUND DEPOSITS

Sarvajit S. Sareen, Cambridge; Lucien Girard, III, Boxboro, and Robert A. Hard, Still River, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Division of Ser. No. 422,233, Dec. 6, 1973, Pat. No. 3,865,435. This application Oct. 24, 1974, Ser. No. 517,677

Int. Cl.[2] E21B *43/26*

U.S. Cl. 166—308 **5 Claims**

1. A method for increasing the permeability of a subterranean formation penetrated by at least one well which extends from the surface of the earth to the formation comprising the steps of injecting an aqueous hydrogen peroxide solution containing a stabilizing agent therefor through said well into the subterranean formation whereby said solution diffuses into the fractures of the formation surrounding said well, the stabilizing agent reacts with metal values in said formation resulting in a substantial reduction of said agent in said solution, and the resultant substantially unstabilized hydrogen peroxide decomposes to form a gaseous medium which causes additional fracturing of the formation.

3,896,880

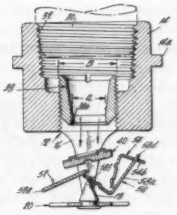
AUTOMATIC SPRINKLER HEAD

Ingemar B. Asp, Beach Rd., Ossining, N.Y. 10562

Filed Feb. 11, 1974, Ser. No. 441,411

Int. Cl. A62c *37/30*, *37/12*; **B05b** *15/08*

U.S. Cl. 169—39 **13 Claims**



1. A sprinkler head adapted to be attached to a supply of fluid under pressure comprising a body having an internal thread, an orifice extending therethrough to allow said fluid to pass through said body, means for connecting said body to said fluid supply, an externally threaded nozzle having an orifice, said nozzle being constructed and arranged to be threaded within said internal thread of said body with said nozzle orifice in communication with said body orifice, valve means for closing said nozzle orifice, a support member extending downwardly from said body and forming a central bearing point, said valve means and said bearing point defining a central axis, temperature-responsive means supported between said valve means and said bearing point and being offset from said central axis, said temperature-responsive means including a strut member, a spring member and an intermediate member connecting said strut member and said spring member, one end of said strut member engaging said valve means and the other end of said strut member bearing against said spring member and said bearing point at a point offset from said central axis, said nozzle and said body being constructed and arranged for adjustment of said nozzle to apply tension to said temperature-responsive assembly between said valve means and said bearing point, said strut member and said intermediate member including faces forming a gap therebetween for receiving fusible material in said gap for connecting said strut member and said intermediate member, said fusible material adapted to fuse at a predetermined temperature and disconnect said strut member and said intermediate member thereby releasing said tension on said temperature-responsive assembly and on said valve means to

allow the fluid under pressure to pass through said body and said nozzle orifices.

3,896,881

AUTOMATIC FIRE EXTINGUISHER FOR A STORAGE TANK WITH FLAMMABLE CONTENTS

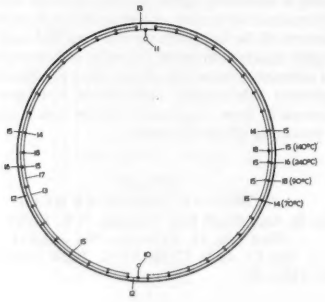
Jan A. De Boer, Hoeven, Netherlands, assignor to Saval B.V., Breda, Netherlands

Filed Feb. 25, 1974, Ser. No. 445,565

Claims priority, application Netherlands, Feb. 27, 1973, 7302725

Int. Cl. A62c *35/54*

U.S. Cl. 169—66 **4 Claims**



1. A fire extinguisher for a storage tank with flammable contents, said tank comprising a roof movable relative to a wall, and said extinguisher comprising a number of reservoirs with fire-extinguishing fluid arranged on said roof, said reservoirs each being connected to a fire-extinguishing pipe provided with heat operated sprinklers for defining a section, said section covering part of the edge of the roof, and chracterized in that said sections overlap each other and that the sprinklers in the overlapping part of said one section have a higher operating temperature than the sprinklers in said other section for first operating the sprinklers in said other section to the exhaustion of said fireextinguishing fluid in said connected reservoir and then operating the sprinklers in said one section.

3,896,882

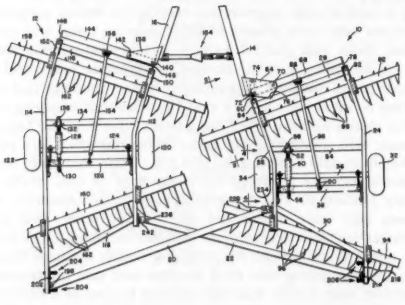
IMPLEMENT FRAME

William Rudolph Frank, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed June 1, 1971, Ser. No. 148,555

Int. Cl. A01b *49/00;* **B62d** *53/00*

U.S. Cl. 172—311 **12 Claims**



1. An implement frame comprising: a pair of subframes disposed in side-by-side relation for normal operating purposes, each of said subframes being supported relative to the ground by a pair of transversely spaced wheel means and rockable vertically about an axis passing through said pair of wheel means; a pair of crossed links interconnecting the rear portions of said subframes, said links being articulately connected to said subframes for relative horizontal and vertical pivotal movement; resilient means connecting at least one of said links to at least one of said subframes for yieldably maintaining said link in a preselected vertical position relative to said subframe; hitch means on the forward portion of at least one of said subframes for attaching said subframe to a towing vehicle; and means interconnecting the forward portions of said subframes, said means being releasable to permit one of said subframes, in response to a moving force acting on the other of said subframes, to swing around to a transport position behind the other subframe wherein it is turned **180** degrees relative to its operating position, said crossed links forming a steering connection between the subframes when disposed in their transport position.

3,896,883

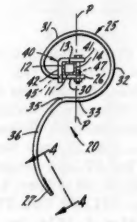
CULTIVATOR TOOTH ASSEMBLY

John N. Howes, Alton, Ill., assignor to Varlen Corporation, East Alton, Ill.

Continuation of Ser. No. 323,309, Jan. 12, 1973, abandoned. This application Sept. 30, 1974, Ser. No. 510,767

Int. Cl. A01b *23/02*

U.S. Cl. 172—707 **1 Claim**



1. A spring tooth assembly for mounting on the tool bar of an agricultural cultivator or the like, comprising:

a. a flexibly resilient strip member formed substantially of a single piece of spring steel in a flat, substantially uniform cross-section from an upper end attachment section to a lower end tip,

b. said attachment section adapted to be clamped to a tool bar and extend rearwardly thereof,

c. said strip member including a first working section curved upwardly and rearwardly and then upwardly and forwardly from said attachment section, around and over the tool bar, said first working section then extending downwardly and rearwardly around and under the tool bar until it has passed the horizontal and is inclined at least slightly upwardly,

d. said strip member then being bent sharply downwardly at a point substantially in vertical alignment with the trailing surface of the tool bar into a section of the strip member which provides a stiffening of the resilient strip member in this area,

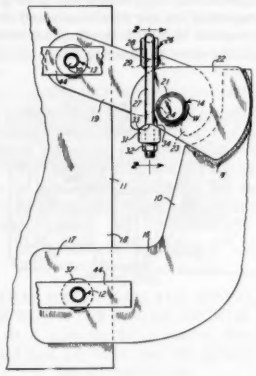
e. said strip member further including a second working section curved downwardly and rearwardly from said stiffening section and then downwardly and forwardly to said tip,

f. said tip terminating in substantial alignment with or only slightly behind the trailing surface of said tool bar.

3,896,884
ANTI-BACKLASH ATTACHMENT MOUNTING

Thomas P. Casey, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed May 10, 1974, Ser. No. 468,820
Int. Cl. A01b *15/14*
U.S. Cl. 172—776 7 Claims



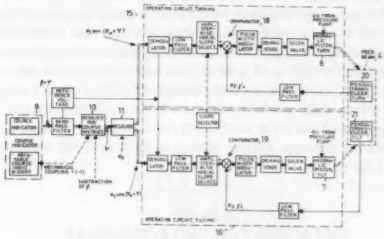
1. An anti-backlash attachment mounting for an implement on a tractor or the like, comprising an attachment mounting piece having two bolt holes spaced apart therein, two arms with one thereof being affixed to a tractor and with each of said arms having a conically-shaped opening in one end of each of said arms, a bushing disposed in each of said conically shaped openings and having a conically shaped exterior for respective snug axial positioning of said bushings in said conically shaped openings and with said bushings having axially disposed openings of the diametrical size of said bolt holes, said arms being respectively aligned on said mounting piece with said bushing axially disposed openings respectively axially aligned with said bolt holes, a bolt snugly disposed in each of the aligned pairs of said bolt holes and said bushing axially disposed openings, a nut tightened on each of said bolts for securing said arms to said mounting piece through the conical shape of said bushings, said arms extending from their respective locations of securement by said bolts on said mounting piece and extending to a location overlapping each other in their extending portions, a horizontally disposed pin extending into respective upper and lower contact with respective ones of the overlapping portions of said arms for joining said arms together, and a clamp connected between said arms overlapping portions for forcing the latter against said pin in their respective upper and lower contact with said pin, and thereby attach said implement to said tractor.

3,896,885
SYSTEM FOR AUTOMATICALLY ALIGNING AND/OR MOVING IN A PARALLEL MOVEMENT PATH A GUIDE SEATING STRUCTURE ADAPTED FOR GUIDING THE MOVEMENT OF A TOOL MOUNTED THEREON

Carl Lennart Dahlstrom, Savedalen, and Tord Richard William Ponton, Molndal, both of Sweden, assignors to AB Skanska Cementgjuteriet, Sweden

Continuation of Ser. No. 206,480, Dec. 9, 1971, abandoned. This application Sept. 10, 1974, Ser. No. 504,702
Claims priority, application Sweden, Dec. 11, 1970, 16811/70; Apr. 21, 1971, 5181/71
Int. Cl. E21c *11/02*
U.S. Cl. 173—2 21 Claims

1. A system for automatically aligning at least one guide seating structure for parallel positions at different locations, said structure being adapted for guiding the movement of a tool mounted thereon as a feed beam for rock drilling machines and the like; said system comprising a movable support unit, jib means supported on said support unit, a seating structure pivotally mounted on said jib means, for movement in two planes disposed at an angle to each other, means for pivoting said seating structure in each of said two planes, means for predetermination of the desired angle of said seating structure with respect to the vertical and the desired bearing of said

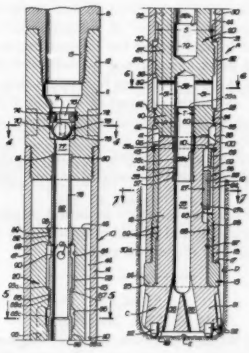


structure with respect to the coordinates of the earth, means for emitting signals responsive to the actual bearing and angle of said seating structure to the vertical when said support unit is moved to a different location, comparator means for comparing the departure of said signals from the predetermined desired bearing and angle of said seating structure and means responsive to the departure of said signals for pivoting means in said two planes for aligning said at least one seating structure to a position parallel to the desired bearing and angle.

3,896,886
BORE HOLE HAMMER DRILL

Theodore J. Roscoe, Jr., Houston, Tex., assignor to Bakerdrill, Inc., Spartanburg, S.C.

Filed Aug. 10, 1973, Ser. No. 387,481
Int. Cl. E21b *5/00*; E21c *7/00*
U.S. Cl. 173—17 19 Claims



1. In percussion drilling apparatus: a housing structure connectable to a drill string; an anvil in the lower portion of said housing structure and operatively connectable to a drill bit; said anvil having an exhaust passage; a hammer piston reciprocable in said housing structure for intermittently impacting against said anvil, said piston having an upper passage; inlet means for directing a fluid medium under pressure into said upper passage; first passage means for directing the fluid

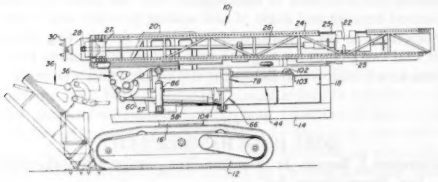
medium from said upper passage into said housing structure above said piston upon upward movement of said piston in said housing structure for driving said hammer piston downwardly toward said anvil; second passage means for directing the fluid medium from said upper passage into said housing structure below said piston upon downward movement of said piston in said housing structure; means for alternately exhausting the fluid medium from the housing structure above and below said piston; stop means for supporting said anvil in a lower position in said housing upon elevation of said housing; means defining a fluid circulating path from the interior of said inlet means to the exterior of said housing structure when said anvil is supported by said stop means; said circulating path including the region of said housing structure around said inlet means above said piston and also said anvil exhaust passage; and valve means for closing off said second passage means when said anvil is supported by said stop means to prevent flow of the fluid medium from said upper passage into said second passage means and into said housing structure below said piston.

3,896,887

MOUNTING FOR DRILL RIG MAST

Malcolm N. Council, Richardson, Tex., assignor to Gardner-Denver Company, Dallas, Tex.

Filed Dec. 26, 1973, Ser. No. 427,610
Int. Cl.[2] E21C 5/11
U.S. Cl. 173—43 **4 Claims**



1. In a mobile drill rig including an undercarriage, a frame mounted on said undercarriage, and an elongated mast including a drill motor mounted for movement along said mast for driving a drill stem, an improved mounting for said mast comprising:

a support mounted on said frame and comprising a cradle member including a pair of spaced apart legs pivotally connected to said frame for limited movement about a horizontal pivot axis formed by said pivotal connection, said support being disposed between a pair of extensible hydraulic cylinders connected to said frame and said support for positioning said support about said horizontal pivot axis;

an elongated boom mounted on said support for linear movement substantially parallel to said horizontal pivot axis; and,

a positioner bracket pivotally mounted on one end of said boom and connected to said mast whereby said mast may be pivoted with respect to said boom.

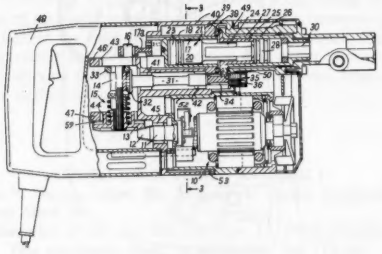
3,896,888

ELECTRIC HAMMER

David Norman William Badcock, London, England, assignor to Kango Electric Hammers Limited, London, England

Filed Apr. 3, 1974, Ser. No. 457,561
Claims priority, application United Kingdom, Apr. 5, 1973, 16458/73
Int. Cl.[2] E21C 3/04
U.S. Cl. 173—109 **2 Claims**

1. A portable percussion tool comprising a casing incorporating a cylinder, a driver and a striker disposed for reciprocating motion in the cylinder, an air chamber being formed axially between the driver and striker in which chamber a quantity of air is trapped, a rotary tool holder mounted for rotary movement in alignment with the striker, an anvil carried in said holder arranged to be struck directly or indirectly by the striker, an electric motor including a stator and stator enclosure and a motor shaft extending therethrough and disposed parallel to the axis of the cylinder, a driving shaft disposed parallel to the motor shaft and the cylinder and arranged to rotate the tool holder, and a crankshaft which is disposed at right angles to the motor shaft and which has a crankpin connected to reciprocate the driver, first meshing bevel gears mounted on the crankshaft and the motor shaft respectively, second meshing bevel gears mounted on the crankshaft and the drive shaft respectively, means for locating



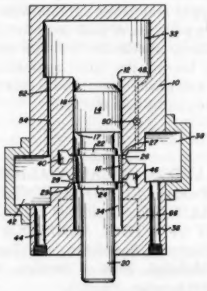
the drive shaft against movement axially of itself in a direction away from the crankshaft, said means being adjustable to permit the drive shaft to be moved axially of itself to move the bevel gear thereon radially clear of the associated second bevel gear on the crankshaft during assembly and dismantling of the tool, and said casing including a member moulded in one piece and which carries an end portion of the cylinder, said member providing bearing supports for the crankshaft and drive shaft and a bearing support adjacent the crankshaft for the motor shaft, and said member having a bore in which is received and radially located an end portion of the stator enclosure of the motor adjacent the crankshaft.

3,896,889

HYDROACOUSTIC APPARATUS

John V. Bouyoucos, Brighton, N.Y., assignor to Hydroacoustics, Inc., Rochester, N.Y.

Filed Aug. 31, 1971, Ser. No. 285,240
Int. Cl. F01l 17/00; F01b 7/18
U.S. Cl. 173—120 **40 Claims**



1. A hydroacoustic oscillator comprising

a. a movable mass having first and second sides,

b. means for continuously applying pressurized fluid to said first side to drive said mass in one direction and for storing energy due to the motion of said mass,

c. a valve mechanism having a valve element, said valve element being disposed in a path for said pressurized fluid

which extends from a region of high pressure to a region of low pressure, said path being in communication with said second side, said valve element being movable in opposite directions for alternately opening said high pressure region to said second side while closing said low pressure region to said second side and then opening said low pressure region to said second side while closing said high pressure region to said second side for establishing alternating fluid pressures upon said mass to produce periodic oscillations of said mass at a frequency and over a displacement determined by said mass and the energy storage characteristics of said fluid communicating therewith, and

d. means for coupling said valve element and said mass for actuating said valve element by said means during a substantial portion of the displacement of said mass with said valve element travelling over a displacement of at least one half of the displacement of said mass so as to enable said valve to attain high velocity at the instants of the opening and closing of said second side to said high and low pressure regions.

3,896,890

EXTERNAL HELIX TUBE FOR INSTALLING SCREW-TYPE EARTH ANCHOR

Jack D. Gale, Rt. 1, Crowley Rd., Crowley, Tex. 75229

Filed Jan. 21, 1974, Ser. No. 435,224

Int. Cl. E02d *5/80*

U.S. Cl. 175—19 **10 Claims**

1. An installation tool for placing a screw-type anchor into the earth, said anchor having a shank and a flight secured thereto near that end of the shank which is to be buried in the earth, comprising:

a. a tube having an inside diameter large enough to envelop the shank;

b. means on the tube for engaging the anchor near its flight end and rotating the same in a first direction to cause the flight to burrow into the earth; and

c. means affixed to the exterior of the tube to cause it to be pushed out of the earth as a result of the tube being rotated in a direction opposite to said first direction.

3,896,891

MODULAR MOTORIZED WHEEL CHAIR

Edward W. Miltenburg, Newport Beach; Donald L. Whetstine, and Howard Carson, both of Costa Mesa, all of Calif., assignors to Stainless Medical Products, Inc., Santa Ana, Calif.

Filed Aug. 31, 1973, Ser. No. 393,449

Int. Cl. A61g *5/04*

U.S. Cl. 180—6.5 **3 Claims**

1. A wheelchair comprising:

a left side module including a left frame, a left rear drive wheel having a horizontal axis of rotation and a castor mounted front wheel;

a first motor and a means for connecting the output of said first motor to said left rear drive wheel;

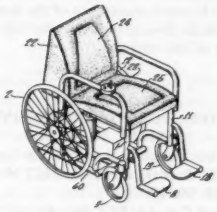
a right side module including a right frame, a right rear drive wheel having a horizontal axis of rotation and a castor mounted front wheel;

a second motor and a means for connecting the output of said second motor to the right rear drive wheel;

a seat comprised of a bucket shaped back module and a bucket shaped bottom module;

means for attaching said seat to said left and right frames so as to enable said seat to be easily and quickly detached from said frames said means comprising:

a pair of substantially vertical elongated projections on the bottom of said bucket shaped back module, said projections being spaced apart so as to be substantially coplanar with said left and right frames, and;



a member of said left frame having an opening adapted to receive one of said bucket seat back projections, and;

a member of said right frame having an opening adapted to receive the other of said bucket seat back projections;

at least one pair of substantially vertical elongated projections on the bottom of said bucket shaped bottom, said projections being spaced apart so as to be substantially coplanar with said left and right side frames, and;

a member of said left frame having an opening adapted to receive one of said bucket seat bottom projections;

a member of said right frame having an opening adapted to receive the other of said bucket seat back projections;

a battery support platform and means for attaching said battery support platform to said left and right frames so as to permit said battery support platform to be easily and quickly removed from said frames.

3,896,892

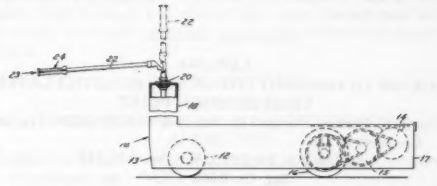
MANUAL CONTROL FOR A SELF-PROPELLED VEHICLE

James P. Kohls, Petoskey; Robert J. Borgman, Harbor Springs, and Frederic W. Campbell, Cross Village, all of Mich., assignors to Jervis B. Webb Company, Detroit, Mich.

Filed Sept. 20, 1973, Ser. No. 398,960

Int. Cl. B62d *51/04*

U.S. Cl. 180—19 H **10 Claims**



1. A manual control for a self-propelled vehicle having a steerable wheel, a driving motor operable in reverse and forward speeds, and a tiller extendable forwardly of the vehicle for manually controlling the steerable wheel, the tiller being provided with a movable handgrip for regulating the operation of the driving motor, wherein the improvement comprises:

means mounting the handgrip on the tiller for movement generally longitudinally thereof in directions which extend rearwardly and forwardly from a neutral position, said mounting means including a cam and a follower, one of which is connected to the handgrip and the other of which is connected to the tiller, said follower engaging said cam which defines said movement of the handgrip and includes a portion extending longitudinally of the tiller and a second portion extending angularly to said longitudinally extending portion to define a sensible transition in said movement of the handgrip between at least one speed of the vehicle driving motor and another speed thereof;

means normally urging the handgrip to said neutral position; and,

control means responsive to said rearward movement of the handgrip for operating the vehicle driving motor in the reverse direction of movement of the vehicle, and responsive to said forward movement of the handgrip for operating the vehicle driving motor in the forward direction of movement of the vehicle.

3,896,893

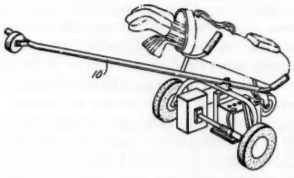
DIFFERENTIAL TORQUE RESPONSIVE AXLE FOR SMALL VEHICLES

Henry Paul Willis, deceased, late of Palm Springs, Calif., and by Norman E. Decker, executor, 1122 Wilshire Blvd., Los Angeles, Calif. 90017

Filed Oct. 1, 1973, Ser. No. 402,391

Int. Cl. B60k *23/06;* **B62d** *51/06*

U.S. Cl. 180—19 R **5 Claims**



1. A driven axle for a vehicle having a pair of coaxially mounted wheels, comprising

a first shaft, said first shaft being rotatably mounted to the vehicle;

a second shaft, said second shaft being rotatably mounted to the vehicle and being coaxial with said first shaft;

a sleeve, said sleeve being positioned over said first and said second coaxial shafts, said sleeve being tightly held to said first shaft and having a radial slit through the wall thereof adjacent said second shaft; and

means for exerting pressure on said sleeve about said second shaft in order that a predetermined level of applied torque is required to twist said second shaft relative to said sleeve.

3,896,894

MEANS TO TRANSMIT POWER ACROSS ARTICULATED VEHICLE HITCH POINT

David S. Vinton, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 24, 1973, Ser. No. 326,418

Int. Cl. B60k *17/34*

U.S. Cl. 180—51 **3 Claims**

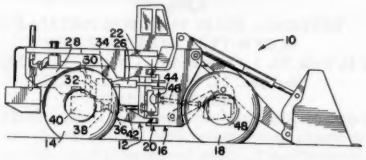
1. In an articulated vehicle having one wheel-mounted frame portion connected to another wheel-mounted frame portion, the frame portion being pivotable relative to the other frame portion about a generally vertical axis, and power means for driving the one frame portion and for rotating a first shaft associated with the one frame portion, power transfer means for driving a second shaft associated with the other frame portion to drive said other frame portion comprising:

a power transfer casing comprising a first casing portion connected to the one frame portion for movement therewith and defining a passage into which the first shaft extends, and a second casing portion, resilient means connecting said second casing portion to the other frame portion for movement therewith and pivotably connected to the first casing portion so as to be pivotable about an axis generally along the pivot axis of one and the other frame portions, and defining a passage into which the second shaft extends, lubricating oil disposed in said power transfer casing;

seal means/interconnecting and disposed between the first and second casing portions for providing sealing therebetween upon pivotal movement of the second casing portion relative to the first casing portion confining said lubricating oil within said power transfer casing;

means for rotatably supporting the first shaft within the passage of the first casing portion;

means for rotatably supporting the second shaft within the passage of the second casing portion;



a substantially vertical shaft supported totally within the power tranfer casing and positioned with its longitudinal axis generally along the pivot axis of the one and the other frame portions and rotatable about its longitudinal axis;

a first bevel gear connected to one end of the substantially vertical shaft for rotation therewith;

a second bevel gear connected to the other end of the substantially vertical shaft for rotation therewith;

a third bevel gear connected to the first shaft for rotation therewith and in engagement with the first bevel gear;

a fourth bevel gear connected to the second shaft for rotation therewith and in engagement with the second bevel gear, so that the power means rotate the first shaft and, through the first and third bevel gears, the substantially vertical shaft, and, through the second and fourth bevel gears, the second shaft to drive the other frame portion, meanwhile allowing articulation of the one frame portion relative to the other frame portion, and said resilient means comprising substantially vertically disposed trunnion means on opposite sides of said second casing portion, resilient bushings disposed on the other frame portion receiving said trunnion means and said trunnion means being substantially parallel to and spaced from said vertical shaft.

3,896,895

AXLE ARRANGEMENT FOR VEHICLES

Otto Wilhelm Oswald Schultz; Hilmar Feutlinske, and Kurt Gentzsch, all of Hamburg, Germany, assignors to Hamburger Hochbahn Aktiengesellschaft, Hamburg, Germany

Filed Nov. 15, 1973, Ser. No. 416,084

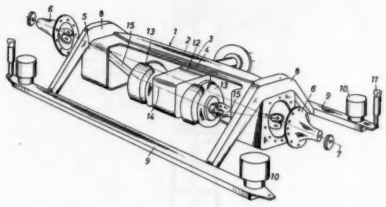
Claims priority, application Germany, Nov. 16, 1972, 2256121

Int. Cl. B60b *35/16*

U.S. Cl. 180—75 **2 Claims**

1. An axle arrangement for a pair of driven wheels of a vehicle such as a bus comprising a transverse bracket member, said bracket being substantially U-shaped in cross-section and with a generally straight transversely extending side wall and with opposed top and bottom walls extending forwardly of

said side wall to define an open portion therein, a pair of opposed end walls intergrally connecting said side wall and said top and bottom walls, opposed coaxial wheel bearings secured to said opposed end walls of said bracket member for supporting said driven wheels, a differential gear secured to the central portion of said bracket, said gear being disposed forwardly in a longitudinal direction from said side wall and having opposed output shafts, braking devices cooperating



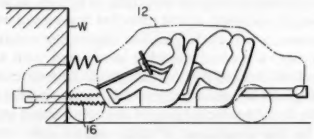
with said output shafts adjacent said differential gear for braking said driven wheels, said braking device being receivable in the open portion of said bracket, the axis of the output shafts of said differential gear being offset downwardly from and parallel to the axis of said coaxial wheel bearings and externally of said bracket member, universal-jointed drive shafts connecting each of the offset output shafts with each of the driven wheels of the vehicle whereby the floor level of the vehicle may be lowered.

3,896,896

MULTI-PROFILED CROSS MEMBER

Shigeru Saitoh, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed May 22, 1973, Ser. No. 362,843
Claims priority, application Japan, May 23, 1972, 47-60181
Int. Cl. B60r *19/00*
U.S. Cl. 180—82 R **4 Claims**



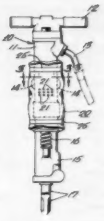
1. In a motor vehicle having a chassis, the improvement comprising at least one pair of laterally spaced elongated deformable side rails which extend longitudinally of the motor vehicle; and at least one plate cross member having at least two spaced fixing portions at each of the opposite ends thereof, said at least one plate cross member being secured to said deformable side rails only at said at least two spaced fixing portions, said spaced fixing portions, when so secured, being longitudinally spaced apart along the length of the side rails only at the positioof the fixing portions and in contact with a single wall surface of said side rails, each of said opposite ends having at least one recess at this position extending longitudinally between said two spaced fixing portions, whereby each of said opposite ends has reduced strength in the longitudinal direction of the motor vehicle.

3,896,897

EXHAUST MUFFLER

Edward O. Hilbush, Jr., West Chester, Pa., assignor to West Chester Chemical Company, Inc., Pa.

Filed Oct. 11, 1973, Ser. No. 405,401
Int. Cl. F01n *3/06*
U.S. Cl. 181—36 A **5 Claims**



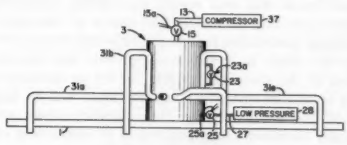
1. A sound-deadening laminated article of manufacture for use in the muffling of exhaust gas noises comprising an inner first sheet of fabric, an intermediate second sheet of open cell, elastomeric material secured to the surface of said inner first sheet, a third sheet of flexible lead of a thickness in the range 0.0075 inch to 0.015 inch secured to the surface of the sheet of elastomeric material, and an outer sheet of fabric secured to the surface of said flexible lead sheet.

3,896,898

HIGH FREQUENCY SEISMIC SOURCE USING COMPRESSED AIR

Robert Andrew Kirby, and Joseph Frank Bayhi, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed June 6, 1973, Ser. No. 367,672
Int. Cl. G01v *1/02*
U.S. Cl. 181—120 **3 Claims**



1. A system for producing seismic energy in a liquid medium including means for compressing gas in a reservoir to a high pressure and valve means for quickly releasing the gas from the reservoir into said liquid medium, the improvement comprising a plurality of elongated conduit means of substantially equal length connected to a common valve means for conducting pressurized gas from said common valve means into said liquid medium and wherein the inner diameters of the plurality of conduit means are of a plurality of different magnitudes.

3,896,899

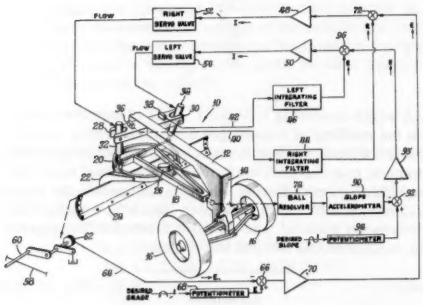
BLADE STABILIZER FOR EARTH WORKING APPARATUS

Rolland D. Scholl, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 21, 1974, Ser. No. 434,982
Int. Cl. E02f *3/76*
U.S. Cl. 172—4.5 **7 Claims**

1. A system compensating both for roll and pitch in an earth working apparatus with respect to a reference plane, the apparatus being of the type having an elongated frame, support means at the fore and aft ends of the frame for supporting

the frame for movement over an earth surface along its longitudinal axis, an earth working blade located between the fore and aft support means, and first and second spaced apart means extending between the blade and the frame for adjustably supporting corresponding spaced apart points of the blade on the frame, said spaced apart means located transversely to the longitudinal axis of the elongated frame so one is on each side thereof, said stabilizing system comprising first and second accelerometers mounted on said frame at transversely spaced apart sites associated with respective said bladee supporting means, each said accelerometer including



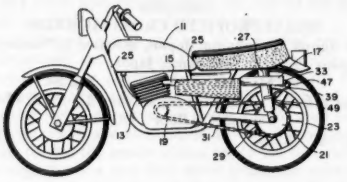
means for generating an electric signal proportional to the magnitude and direction of the vertical acceleration of the associated frame site, and means operatively connected to said blade supporting means and responsive to respective said electric signal generating means for adjusting respective said points of the blade in a direction opposite the direction of movement of the associated frame site by an amount corresponding to displacement of the associated site so that the position of the blade relative the reference plane remains substantially constant and independent of movement of said frame relative the reference plane.

3,896,900
LADDER ATTACHMENT
Warren S. Hunter, Battle Lake, Minn. 56515
Filed Nov. 5, 1974, Ser. No. 520,990
Int. Cl.[2] E06C *7/48*
U.S. Cl. 182—206 **7 Claims**

1. A ladder attachment for clamping the end of a ladder to an upright pole member, the ladder having a pair of side rail members and a plurality of spaced steps extending therebetween comprising, a rod-like member having a transversely extending mounting flange connected to and extending to either side of said rod-like member, connection means mounted on the ends of the mounting flange and adapted to encircle and secure the mounting flange to the top step of a ladder, said rod having one extremity extending beyond the mounting flange and beyond the next adjacent step of the ladder, a pair of spaced flange members positioned on the rod-like member and secured thereto remote from the mounting flange and beyond the end of the ladder, said flange members extending to one side of the rod-like member, pole gripping means mounted on the spaced flange members and extending perpendicular to the rod and in opposite directions, said pole gripping means respectively being adapted to be positioned on opposite sides of the pole member to which the

attachment is to secure the ladder with a pole gripping means binding on the pole member.

3,896,901
AUTOMATIC CHAIN LUBRICATOR FOR MOTORCYCLES AND THE LIKE
Alvino J. Ango, 1252 Elliot, Madison Heights, Mich. 48071
Filed Feb. 21, 1974, Ser. No. 444,527
Int. Cl.[2] F16N *7/30*
U.S. Cl. 184—15 R **26 Claims**



17. In a machine having a supporting structure, at least one rotatable output member, a first sprocket associated with said output member, a two cycle gasoline engine for rotating said output member, a second sprocket associated with said engine, an endless drive chain coupling said first sprocket and said second sprocket, and an engine discharge pipe for accommodating the forcible discharging of the combustion emissions generated by the operation of said engine, said emissions including a residual of oil from the mixture thereof with the gasoline utilized in the operation of said engine, the improvement comprising:

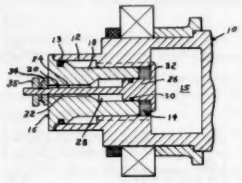
a. a collector means communicably coupled to said engine discharge pipe and effective for captively collecting a portion of said emissions discharged therefrom, and

b. a diverter means coupled to said collector means and to said supporting structure and effective for directing the captively collected forcibly discharged emissions onto the endless drive chain such that dirt particles that may have collected thereon are displaced therefrom and the residual of oil forming a part of said emissions is distributed therealong as said drive chain and said first and second sprockets are rotated by said engine, whereby the operating efficiency of said drive chain and said first and second sprockets is enhanced and prolonged without regularly and periodically attending to their cleaning and spray lubrication.

3,896,902
PLUG FOR DRIVE SHAFT WITH INTERNAL DRIVE SPLINE

Charles C. Queen, Jr., Cookeville, Tenn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 30, 1974, Ser. No. 474,564
Int. Cl. F16n *31/00*
U.S. Cl. 184—88 R **1 Claim**



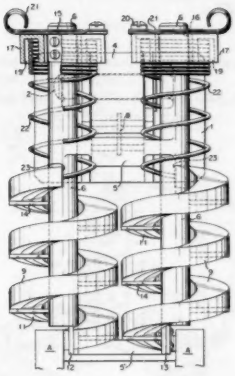
1. In combination with a drive shaft having a central opening; an internal lubricated spline within said opening and spaced from the end of said shaft, with said opening extending beyond the spline to form a central cavity within the shaft; a plug assembly, comprising: a plug member having a portion positioned within the spline of said drive shaft and substantially conforming to the inner diameter of the spline; said plug member having a flange member engaging the end of said shaft, a circumferential groove in the plug member adjacent the flange member near the outer end of said opening; an O-ring in said groove, for sealing said plug within said drive shaft; a cylindrical hole through said plug member; said hole being offset from the center of said plug member; a rotatable bolt member having a cylindrical shaft passing through said hole in said plug member; said bolt member having an off-center head member extending into said central cavity and engaging the inner edge of the spline; a circumferential groove in the portion of said bolt member within said plug; an O-ring in the circumferential groove in said bolt member for sealing the bolt member in said plug; said bolt member having a threaded portion on the end remote from said head member; a pair of lock nuts threaded onto the threaded end of said bolt member for retaining the off-center head member in engagement with the inner edge of the spline, to thereby retain said flange in engagement with the end of said shaft; said off-center head member being adapted to pass through said spline in one angular position of said bolt member in said plug member.

3,896,903
SOLID LUBRICANT FEED DEVICE

Kiyotaka Takimoto, No. 16-2, Asahi-cho 2-chome, Fuchu, Tokyo, Japan

Filed Mar. 8, 1974, Ser. No. 449,460
Claims priority, application Japan, Mar. 20, 1973, 48-32464
Int. Cl.² F16N *15/00*
U.S. Cl. 184—99 **5 Claims**

1. A device, for applying one end of a spiral shape strip of solid lubricant to a surface to be lubricated, comprising, in combination, means forming a support axis; a spiral guide supported on and surrounding said means, and having one end adapted to be positioned adjacent the surface to be lubricated, said spiral guide having a constant pitch and radius and being formed to have supporting and guiding engagement with a spiral strip of solid lubricant when disposed therealong; and means on said device for imparting a spiral force along said spiral guide in the direction of said one end and operable to engage the opposite end of a spiral strip of solid lubricant when supported on said spiral guide and apply pressure thereto to maintain the one end thereof engaged with the surface to be lubricated, and to impart a spiral motion to a spiral strip of solid lubricant when supported on said spiral guide to advance the solid lubricant along said spiral guide as

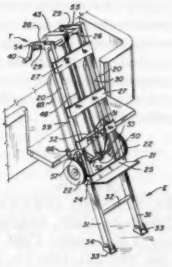


the one end of the solid lubricant is worn away by the surface to be lubricated.

3,896,904
TWO-WHEEL HAND TRUCK WITH ELEVATOR

Bruce A. Walker, 13581 Sable Blvd., Brighton, Colo. 80601

Filed Apr. 29, 1974, Ser. No. 464,805
Int. Cl.² B66B *9/20*
U.S. Cl. 187—9 R **12 Claims**



1. A two-wheel hand truck having an elevator mechanism to facilitate raising and lowering the hand truck to and from an elevated deck and comprising:

a. a hand truck structure including a pair of longitudinally extended tubular rails open at their bottom ends, a transverse pickup lip outstanding from the bottom front edge of the rails, a pair of spaced wheels mounted upon a transversely disposed wheel shaft adjacent to the bottom back edge of the rails and a handle at the top of the rails, all in an arrangement which permits a load to be picked up by the lip and lie against the front side of the rails when the truck is tipped rearwardly onto the wheels;

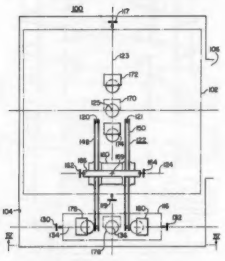
b. said elevator mechanism including a leg telescopically carried in each rail; and

c. a means to extend and to retract a substantial portion of the legs from the bottom of the rails in unison to raise and lower the truck with a load thereon.

3,896,905
ELEVATOR SYSTEM

Frederick Solymos, Glenridge, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 30, 1974, Ser. No. 510,828
Int. Cl. B66b *11/00*
U.S. Cl. 187—22 8 Claims



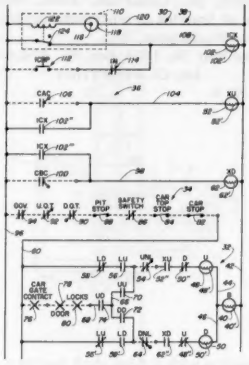
1. An elevator system, comprising:
an elevator car,
a counterweight,
means including traction drive means and hoist roping mounting said elevator car and counterweight for movement in a predetermined travel path,
means guiding the movement of said elevator car including first and second guide rails,
a compensator sheave disposed below the travel path of said elevator car,
and compensating rope means interconnecting said elevator car and counterweight via said compensator sheave, said compensator sheave including first and second rims interconnected and spaced via a hub portion with said compensator sheave being disposed such that its first and second spaced rims straddle one of the first and second guide rails.

3,896,906
SEISMIC SENSING APPARATUS

William M. Shrum, Miraleste, Calif., assignor to Maxton Manufacturing Company, Los Angeles, Calif.

Division of Ser. No. 191,281, Oct. 21, 1971, Pat. No. 3,815,710. This application Jan. 23, 1974, Ser. No. 435,808
Int. Cl. H01h *35/14*
U.S. Cl. 187—29 R 2 Claims

1. A seismic sensing apparatus comprising:
sensing circuitry including a seismic sensitive contact to be activated by a seismic disturbance of predetermined magnitude;
first means to be actuated by said contact, said first means being coupled to a first circuit path and a second circuit path, upon activation of said first means de-energization occurs of either said first path or said second path;
second means coupled within said first circuit path, third means coupled within said second circuit path, said second means to either transmit or non-transmit energy within said first circuit path, said third means to either transmit or non-transmit energy within said second circuit path, with said second means positioned so as to effect transmission of energy said third means being positioned to not transmit energy, with said third means being positioned to transmit energy said second means being positioned to not transmit energy, said first means being

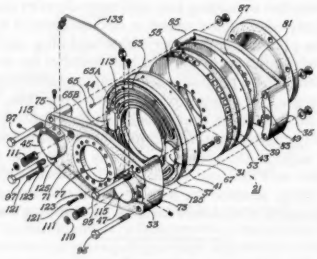


located in parallel with respect to each of said second means and said third means.

3,896,907
HYDRAULIC DISC BRAKE

Charles L. Baxendale, Burleson, Tex., assignor to Mechanics, Inc., Tex.

Filed Aug. 16, 1974, Ser. No. 498,139
Int. Cl. F16d *55/228*
U.S. Cl. 188—72.5 8 Claims



1. In a disc brake assembly for a wheel of a vehicle comprising:
a rotatable disc means adapted to be coupled to a wheel for rotation with the wheel about its axis,
frame means adapted to be fixedly secured to the vehicle and including inner and outer housing means adapted to be located on opposite sides of said disc means with said outer housing means located on the outer side of said disc means and said inner housing means located on the inner side of said disc means,
brake shoe means adapted to be supported on opposite sides of said disc means between said disc means and the walls of said inner and outer housing means respectively, said brake shoe means being supported for axial movement toward and away from said disc means for effectively engaging and disengaging said disc means,
each housing means having at least two cylindrical bores formed therein,
each cylindrical bore of said inner housing means being located opposite a cylindrical bore of said outer housing means,

a piston assembly slidably located in each cylindrical bore and adapted to engage its associated brake shoe means, and

means for admitting fluid under pressure to said cylindrical bores to move said piston assemblies and hence said brake shoe means toward said disc means for engaging said brake shoe means with said disc means,

an improved piston assembly, comprising:

a cylindrical piston member having a front side and opposite rear side to which fluid pressure is applied for moving said piston member toward its associated brake shoe means,

a groove formed in the periphery of said piston member, a resilient O-ring located in said groove,

a flexible, closed, ring-shaped support member located in said groove between said O-ring and the front side of said piston member,

a thin disc wiper member formed of soft metal located in front of said piston member and having a diameter slightly greater than the diameter of said piston member,

a disc shaped heat shield located in front of said disc wiper member, and

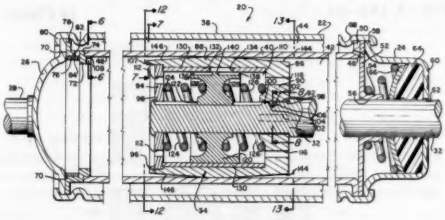
a protective metallic disc located in front of said heat shield for engaging the associated brake shoe means when said piston member is moved by fluid pressure toward its associated brake shoe means.

3,896,908

SHOCK ABSORBING APPARATUS

Harry A. Petrak, Boulder, Colo., assignor to Triple S Industries, Inc., Boulder, Colo.

Filed May 4, 1973, Ser. No. 357,452
Int. Cl. F16f *9/19*
U.S. Cl. 188—280 **21 Claims**



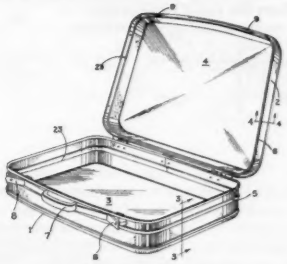
1. A fluid flow control apparatus having a hollow cylinder provided with end walls at opposite ends thereof, a quantity of fluid in the cylinder, and a piston assembly having a piston member slidable axially within the cylinder, said piston member having an internal chamber in fluid communication with the fluid within said cylinder at opposite ends of said piston member, slide valve means disposed in said internal chamber movable axially with respect to said piston member, fluid by-pass passage means located within said internal chamber having a plurality of spaced openings each defining a selectively variable cross-sectional opening size and configuration for establishing fluid communication between opposite sides of said slide valve means when traversed by said slide valve means, resilient means associated with said slide valve means yieldingly resisting axial movement of said slide valve means in opposite axial directions, said slide valve means movable through said internal chamber in response to fluid pressure to traverse said fluid by-pass passage means for selectively controlling the rate of flow of fluid past said slide valve means within said internal chamber, the cross-sectional opening size and configuration of each of the openings of said fluid by-pass passage means being varied in accordance with preselected pressure resistance levels in the direction of movement of said slide valve means thereacross, said fluid by-pass passage means thereby cooperating with said resilient means in establishing changes in resistance pressure of the fluid on opposite sides of said slide valve means notwithstanding changes in the speed of movement of said piston through said cylinder when said slide valve means moves axially with respect to said piston member to traverse said by-pass passage means.

3,896,909

TRAVEL CASES

Richard Edward Kellett, Manchester, England, assignor to Antler Limited, Bury, England

Filed Feb. 27, 1974, Ser. No. 446,316
Int. Cl.² A45C *13/02*
U.S. Cl. 190—53 **12 Claims**



1. A lined travel case comprising two hollow shells each of which has a mouth to its interior and which are hingedly connected together with their said mouths towards one another, a pre-formed lining of soft material fitted into one of said shells being of substantially bag form corresponding to the internal shape of said one shell and having a mouth of corresponding shape to said mouth of said one shell, a continuous edging of relatively stiff material secured to said lining around said mouth thereof, a continuous formation on said edging which extends along said edging externally of said mouth of said lining, and a complementary continuous formation fixed with respect to said one shell and extending around the interior of said mouth of said one shell, said formation and complementary formation being adapted for resilient interconnection and comprising in respect of one of them an undercut channel having a longitudinally extending opening thereinto and in respect of the other a projection having an enlarged portion which is wider than said opening and engages with snap-action in said channel through said opening, thereby providing a joint between said formations which retains said lining in said one shell, a part on said one shell extending around said mouth thereof outwardly beyond said complementary formation, and said edging having a self-supporting trim projection which extends outwardly away from said mouth of said lining to said part of said one shell and conceals said joint.

3,896,910

INTERRELATED CONTROL FOR A SLIPPING CLUTCH AND ASSOCIATED TRANSMISSION

Sidney J. Audiffred, Washington; David W. Bump; Raymond N. Erkkila, both of Morton; Lowell E. Johnson, and Shairyl I. Pearce, both of East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 212,206, Dec. 27, 1971, Pat. No. 3,822,771. This application July 26, 1973, Ser. No. 382,717
Int. Cl. B60k *29/00*
U.S. Cl. 192—3.57 **3 Claims**

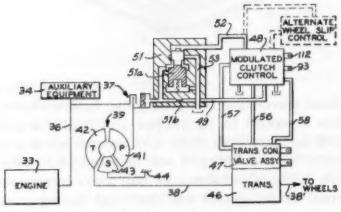
1. A hydraulic control system for a power train, the power train proportioning power from a prime mover to auxiliary equipment and a primary output shaft, the power train including an input means coupling the prime mover with the auxili-

ary equipment, an output means operatively coupled with the primary output shaft and a slipping clutch providing a variable coupling between the input and output means and a transmission having directional and speed range gears respectively controlled by hydraulically operable clutch means is arranged between the power output means and the primary output shaft, a transmission control valve assembly being in communication with the transmission to selectively pressurize the transmission clutch means, comprising

a valve assembly for hydraulically varying engagement of the slipping clutch, the valve assembly including an input valve means for communicating actuating fluid through an inlet conduit to the slipping clutch, and

a regulating valve being adjustable to selectively vary pressure of the actuating fluid communicated to the slipping clutch from the input valve means,

a conduit means including a restriction,



the input valve means being in connection with the control valve assembly through the conduit means for delivering actuating fluid pressure to the slipping clutch in delayed proportion to engagement of the hydraulically operable clutch means in the transmission,

manual control means coupled with the regulating valve for adjustment thereof, and

slip indicating means operatively associated with the manual control means for providing a feedback signal when a selected level of torque is being transferred through the slipping clutch, the slip limiting means including resilient abutment means for contacting and resisting operation of the manual control means only after the manual control means has been moved a predetermined distance for the selected level of torque transmission, and manually adjustable means operatively coupled with the resilient abutment means for varying the effective position of the resilient abutment means and thereby adjusting the selected level of torque transmission.

3,896,911

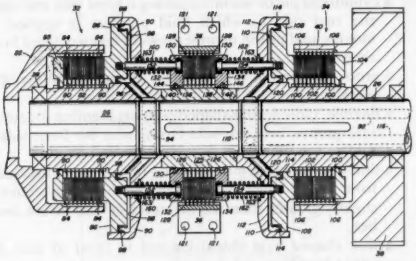
TWO-SPEED CLUTCH AND BRAKE SYSTEM

Jene A. Beneke, Parker, Tex., assignor to Verson Allsteel Press Co., Dallas, Tex.

Filed Mar. 25, 1974, Ser. No. 454,271

Int. Cl. F16d *67/04*

U.S. Cl. 192—18 A **10 Claims**



8. The clutch system of claim **7** wherein said stationary housing comprises:

a circular housing surrounding said fifth friction surfaces and including gear teeth for keying with the periphery of said fifth friction surfaces.

3,896,912

HYDROSTATIC CLUTCH

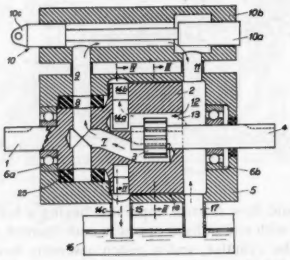
Ivan Jaroslav Cyphelly, Neuhaus, 8128 Hinteregg, Switzerland

Filed May 17, 1974, Ser. No. 471,031

Claims priority, application Switzerland, June 29, 1973, 9530/73

Int. Cl. F16d *31/04*

U.S. Cl. 192—61 **10 Claims**



1. A hydrostatic clutch comprising:

a. an input shaft;

b. an output shaft;

c. a positive displacement pump including a casing element having a cavity, an intake port and a discharge port communicating with said cavity, and a pumping element movable in said cavity,

1. said elements being connected to said shafts respectively for pumping a fluid from said intake port to said discharge port when one of said shafts rotates at a speed different from the speed of rotation of the other shaft;

d. conduit means constituting a pumping circuit connecting said ports;

e. valve means in said circuit;

f. a body of liquid in said circuit and in said casing element;

g. actuating means for moving said valve means between a first position in which said valve means blocks said circuit, whereby said clutch is engaged for transmitting torque between said shafts, and a second position in

which said liquid is free to be pumped through said circuit by said pump, whereby said clutch is disengaged; and

h. temperature control means responsive to said moving of said valve means for withdrawing thermal energy from said liquid in said casing element at a higher rate when said valve means is in said first position than when said valve means is in said second position.

3,896,913

THROTTLE AND IGNITION TIMING CONTROLLED BY CLUTCH AND TRANSMISSION

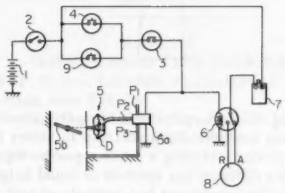
Hiroyuki Maruoka, Yokohama, and Giichi Shioyama, Yokosuka, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Apr. 5, 1973, Ser. No. 348,027

Claims priority, application Japan, Apr. 28, 1972, 47-43185; Sept. 12, 1972, 47-106283

Int. Cl. F02p *5/04;* **F16d** *23/00*

U.S. Cl. 192—.062 **3 Claims**



1. A ignition timing change-over system for a vehicle internal combustion engine having an intake manifold, a throttle valve, an acceleration control member, a gear shift lever and a pedal actuated clutch the system comprising, in combination:

an ignition coil,

a distributor provided with an ignition spark advancing point and ignition spark retarding point for advancing and retarding spark in dependence on engine speed,

a relay switch, the coil of which is normally de-energized for the switch to connect said ignition spark advancing point to said ignition coil,

a dc power source,

an ignition change-over circuit arranged to close when said engine is idling under given conditions for connecting said relay switch coil through an ignition switch to said dc power source to energize said relay switch coil causing said relay switch to switch and connect said ignition spark retarding point with said ignition coil, said ignition change-over circuit including in series a thermostatic switch which is adapted to close at an engine temperature below a predetermined level, a neutral switch which is adapted to close when said gear shift lever is in neutral position, and a clutch switch which is connected in parallel with said neutral switch and adapted to close when said clutch pedal is depressed, and

a throttle valve opener comprising solenoid means connected in parallel with said relay switch coil for opening said throttle valve when said ignition change-over circuit is closed and said ignition spark retarding point is connected to said ignition coil.

3,896,914

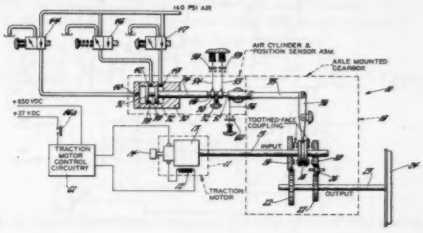
VEHICLE DRIVE WITH CLUTCH ENGAGEMENT CONTROL

Robert H. Konsbruck, Palatine, and Robert T. Scott, Joliet, both of Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed May 31, 1974, Ser. No. 474,968

Int. Cl. B60k *21/00*

U.S. Cl. 192—.098 **3 Claims**



2. A vehicle drive comprising

a drive motor operable in one direction of rotation,

an output member operable in both directions of rotation,

mechanical drive means operable to connect said drive motor and said output member and including a toothed coupling movable to extreme forward and reverse engaged positions, in which said drive motor and output member are operably connected, and to intermediate positions including neutral, forward abutment and reverse abutment positions in which said drive motor and output member are operably disconnected,

electrical motor control means operative to permit application of power to said drive motor when said coupling is in either of its engaged positions or when said coupling is in either of its abutment positions and operated below a predetermined speed suitable for engagement, said motor control means being further operative to cut off power to said drive motor when said coupling is in its neutral position or when said coupling is in either of its abutment positions and said motor is operated above said predetermined speed, and

means selectively operable to move said clutch to its forward, neutral and reverse positions.

3,896,915

VENDING MACHINE

Yukichi Hayashi; Yutaka Yokoda, both of Tokyo; Masayuki Tamura, Sakado; Shinichi Kobayashi, Kamihukuoka; Kazuyuki Akai, Tokyo, and Seiu Sakai, Yamato, all of Japan, assignors to Nippon Coinco Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1974, Ser. No. 432,977

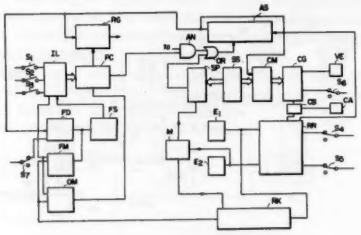
Claims priority, application Japan, Jan. 17, 1973, 48-7549; Feb. 13, 1973, 48-17721; July 24, 1973, 48-83328; July 24, 1973, 48-83329; July 27, 1973, 48-84684; Aug. 22, 1973, 48-94078; Aug. 22, 1973, 48-94079; Aug. 23, 1973, 48-98931

Int. Cl.[2] G07F *5/20*

U.S. Cl. 194—1 N **7 Claims**

1. A vending machine comprising means for producing pulses corresponding in number to the value of a deposited coin and a coin paid out, addition and subtraction counter means for making addition by said pulses produced upon insertion of the coin and making subtraction by said pulses produced upon paying out of the coin, a temporary retention mechanism for temporarily retaining a coin of large denomination among coins to be inserted, means for storing the inserted coins except the retained coin to corresponding change coin stacking tubes, coin memories respectively storing the numbers of coins of particular denominations among the inserted coins, electromagnetic control means for directing the temporarily retained coin to a cash box upon receipt

of a vend instruction signal and directing the coin to a return outlet upon receipt of a return signal, means for producing a signal corresponding to a set vend price, means for obtaining a count corresponding to the value of the required change by making subtraction upon application of the signal corresponding to the set vend price to said addition and subtraction counter means, detection means for detecting whether the change can be paid out in coins of a plurality of denomina-



tions, coin return means for reading the contents of said coin memories and returning coins of the same denominations as the inserted coins from the temporary retention mechanism and the change coin stacking tubes when the inserted coins should be returned, and change pay out means for reading the contents of said coin, memories and delivering a least possible number of coins as change upon said detection when change should be paid out.

3,896,916

MECHANISM FOR SENSING THE THICKNESS AND DIAMETER OF COINS IN COIN OPERATED DEVICES

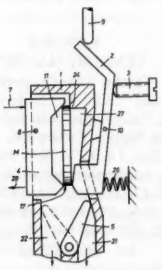
Hugo Ruzic, Leonberg; Robert Scholpp, Stuttgart, and Paul Gerhard Vomel, Moglingen, all of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 22, 1974, Ser. No. 444,638

Claims priority, application Germany, Mar. 16, 1973, 2313241

Int. Cl. G07f *3/02*

U.S. Cl. 194—102 **7 Claims**



1. A mechanism for sensing the thickness and diameter of coins in coin operated devices comprising:

a housing including a coin entrance slot;

a first coin sensing member adjacent said entrance slot pivotably attached to said housing, said first sensing member having top and bottom projections, said top projection being spring loaded relative to said housing; and

a second coin sensing member pivotably attached to said housing and cooperating with said first coin sensing member to form two movably separable coin transfer surfaces, said second sensing member being spring loaded relative to the bottom projection of said first member, said bottom projection of said first member forming coin transfer surfaces in cooperation with said second sensing member so that a coin of particular thickness in diameter will pass between the top projection of said first member and said housing and provide a stop for said spring loaded top projection preventing said bottom projection coin transfer surface from moving away from said second member coin transfer surface thereby preventing said coin of particular thickness and diameter from falling through the opening therebetween said coin transfer surfaces.

3,896,917

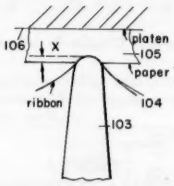
BINARY BAR CODE PRINTING DEVICE AND BINARY BAR CODE PRINTED MATTER

John F. Taplin, West Newton, Mass., assignor to Taplin Business Machines Incorporated, Burlington, Mass.

Filed June 23, 1972, Ser. No. 265,637

Int. Cl. B41j *3/00;* **B41b** *1/02;* **G06k** *19/06*

U.S. Cl. 197—1 R **11 Claims**



1. A printing device for printing information simultaneously in form of man readable characters and in binary bar form, said printing device including a set of types having the same size and having different bar symbols of equal height on the faces thereof, the constituent bar symbols of said set being members of a group including 128 possible combinations each formed by four bars and three inter-bar spaces, each of said bar symbols forming a pattern of alternating bars and inter-bar spaces, and each of said bar symbols beginning with a bar and ending with a bar, each of said bars having either of two different fixed widths and each of said inter-bar spaces having either of two different fixed widths so that the possible number of said bar symbols of said set complies with the equation $128=2^{(b+s)}$, wherein b is the number of said bars of each of said bar symbols on the faces of said types of said set and s is the number of said inter-bar spaces of each of said bar symbols on the faces of said types of said set, said two different fixed widths of said bars including a wide and a narrow bar width, and said two different fixed widths of said inter-bar spaces including a wide and a narrow inter-bar space width, said wide inter-space width exceeding said wide bar width and said narrow inter-space width exceeding said narrow bar width.

3,896,918

MOSAIC PRINTING HEAD WITH ELECTROMAGNETICALLY ACTUATED NEEDLES WITH A COMMON YOKE FOR ALL ELECTROMAGNETS

Winfried Schneider, Alderweg 16, Schloss Neuhaus, Germany

Continuation of Ser. No. 227,515, Feb. 18, 1972, abandoned. This application Aug. 20, 1973, Ser. No. 389,509

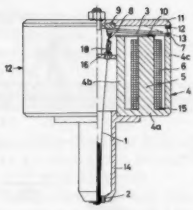
Claims priority, application Germany, Mar. 4, 1971, 2110410

Int. Cl. B41j *3/04*

U.S. Cl. 197—1 R **4 Claims**

1. An electromagnetic drive for the operation of printing needles of a mosaic printing head, comprising a housing having a tubular support portion with a guide for a plurality of needles, a plurality of needles in said guide arranged for substantially axial movement for printing, an annular common magnetic yoke for all of said needles made of magnetic mate-

rial and being connected to said support portion, said yoke including an outer and an inner annular wall portions located exteriorly of and generally concentric to said needles, said yoke also including a pole piece of magnetic material for each needle arranged in circumferentially spaced locations between said outer and inner wall portions and each having a



coil winding, said pole pieces and said outer and inner walls having outer end faces terminating in substantially the same plane, an armature having an outer end pivoted on said outer annular wall portion and overlying said pole piece and the end face of said inner annular wall portion and having an inner end connected to a respective needle, and spring means biasing said armature away from engagement with said pole piece.

3,896,919

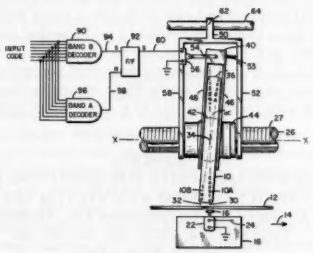
DOUBLE BAND TYPE CARRIER

Ronald W. F. Hutley, Lansdale, Pa., assignor to Sperry Rand Corporation, Blue Bell, Pa.

Filed Dec. 21, 1973, Ser. No. 427,386

Int. Cl. B41j *1/34*

U.S. Cl. 197—49 **5 Claims**



1. An impact printer for representing characters on a record medium, comprising: a continuously rotating typewheel having an axis of rotation and having a generally spherically shaped face section perpendicular to the radii of said typewheel, said typewheel having first and second bands of type characters, at least some of the type characters on said first band being different in type than the type characters on said second band, each band being arranged on the face of said typewheel in a circular path extending about the periphery of said typewheel, said circular path defining a type plane, said type planes intersecting each other at two points on the wheel and crossing a projection of the axis of the typewheel at a predetermined angle when its typeband is in printing position and at an angle other than said predetermined angle when its typeband is not in printing position; a hub keyed to said typewheel, said typewheel being deflectable about the axis of said hub, print actuator means aligned with said typewheel; means for translating said typewheel and said print actuator means across a row of said record medium, and means for deflecting said typewheel to align a selected one of said bands with said print actuator means in response to a control signal signifying that a desired character on said selected band is to be imprinted on said record medium.

3,896,920

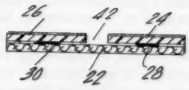
TYPEWRITER RIBBON FOR TYPING AND CORRECTING

Victor Barouh, 935 Plum Tree Rd. West, Westbury, N.Y. 11552, and Robert Glenn, 70-20 108th St., Forest Hills, N.Y. 11375

Continuation-in-part of Ser. No. 187,947, Oct. 12, 1971, Pat. No. 3,752,291. This application Apr. 2, 1973, Ser. No. 347,359. The portion of the term of this patent subsequent to Aug. 14, 1990, has been disclaimed.

Int. Cl. B41j *31/02*

U.S. Cl. 197—172 **1 Claim**



1. A typewriter ribbon comprising a base strip of thin woven plastic light transmitting non-inked material, spaced paralled coatings of adhesive on said base strip, a correction strip comprising an elongated strip of material coated with a correction material and a transfer strip of fluid impervious thin plastic material coated with a transfer material, said correction strip and said transfer strip being bonded to said base strip by said adhesive coatings, said transfer strip and said correction strip being arranged in spaced paralled relationship with said tranfer strip and said correction strip each being arranged along a respective edge of said base strip with a central light transmitting window therebetween for facilitating proper alignment for correction of typewritten impressions, said transfer strip and said correction strip being of the same thickness so that said typewriter ribbon can be wound and rewound flatly and evenly, said transfer strip and said correction strip being substantially wider than said adhesive coatings with said adhesive coating medially disposed between the edges of said correction strip and said transfer strip forming cushions for the central portions of said correction strip and said transfer strip so that the impressions therefrom are enhanced.

3,896,921

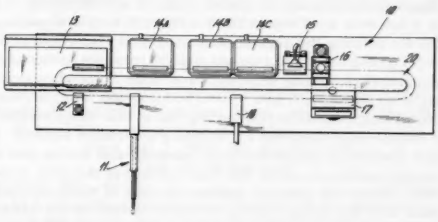
CONVEYOR SYSTEM FOR TRANSPORTING WORKPIECES THROUGH A PROCESSING CYCLE

William Sund, Luc; George Khouzam, Candiac, both of Canada, and Hani Tawil, River Vale, N.J., assignors to Electrovert Manufacturing Co. Ltd., Mount Vernon, N.Y.

Filed Oct. 11, 1973, Ser. No. 405,285

Int. Cl.[2] B65G *25/00*

U.S. Cl. 198—19 **6 Claims**



1. A conveyor system, for receiving, transporting and discharging workpieces to be processed at processing stations, comprising, in combination, an elongated guide rail arranged to extend substantially horizontally past a series of workpiece processing stations; a driven chain extending in laterally confined relation along and guided in said guide rail; runners engaged with said guide rail for guided movement therealong past the processing stations; respective workpiece supports

mounted on each runner; respective latch means on each runner operable to couple the associated runner to said chain and to uncouple the associated runner from said chain; said guide rail having idling portions extending therealong at certain of said processing stations; means operable, as each runner reaches an idling portion to disengage the associated latch means from said chain to idle the associated runner; each runner being moved along an idling portion by succeeding runners moved into the idling portion by said chain; and means operable, as each runner reaches the end of an idler portion, to re-engage the associated latch means with said chain to couple the runner to said chain for movement along said guide rail thereby; said guide rail is an elongated metal extrusion having formed therein an elongated slot receiving said chain and confining said chain both laterally and vertically of said guide rail; a guide rail cover which is an elongated metal extrusion arranged to be secured to said guide rail and defining, with said guide rail, a guiding channel for said runners; said guide rail having a depending portion extending therealong and forming a substantially vertically oriented guiding surface; each runner having a first guide engageable with a surface of said channel and a second guide engageable with said substantially vertical guiding surfaces.

3,896,922

PROOFING BOX PLANT

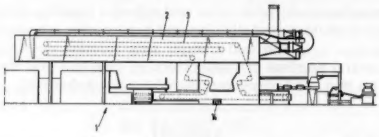
Frank Cornelis De Jong, Dordrecht, Netherlands, assignor to Winkler-Den Boer, N.V., Dordrecht, Netherlands

Continuation of Ser. No. 267,036, June 28, 1972, abandoned. This application Dec. 3, 1973, Ser. No. 421,264

Claims priority, application Netherlands, July 29, 1971, 7110470

Int. Cl. B65g *15/28*

U.S. Cl. 198—155 **3 Claims**



1. In a proofing box plate for raising dough products, a conveyor comprising two transversely spaced parallel endless conveyor chains, a plurality of carrying plates arranged in the space between the chains, pivot pins connecting each of the carrying plates to the chains and defining a tilting axis for the respective plate, a stationary guiding rail extending along at least one of said chains, forward and rear guiding elements disposed on said plates at opposite sides of said tilting axis and in a common level therewith to cooperate with said guiding rail for defining the angular position of said plates, said conveyor having a first and a second straight conveyor section and therebetween a tilting section to invert said plates when moving from said first to said second section, said tilting section comprising a recess in said guiding rail at said tilting section, a hinged plate mounted for swinging movement between a first position in which the plate occupies said recess and a second position in which the lower surface of the plate positively forces the forward guiding element of each carrying plate into the recess during travelling motion of the plates from the first section into said tilting section, said tilting section also comprising a deflecting rail having a first inclined portion extending downwardly from said hinged plate, said first portion joining with a second inclined portion extending upwardly to a second recess in said guiding rail and means at the location where said first and second inclined rail portions are joined for guiding said forward guiding element from said first portion into said second portion during movement of said chains.

3,896,923

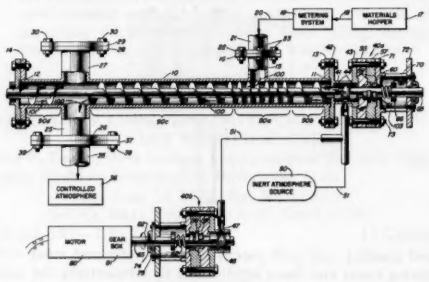
SCREW FEEDER

John M. Griffith, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Feb. 6, 1974, Ser. No. 440,100

Int. Cl. B65g *33/14*

U.S. Cl. 198—214 **6 Claims**



1. An apparatus for feeding a powdered compactible material into a system which is under controlled atmosphere comprising:

a. an elongated tube having first and second ends;

b. a shaft positioned axially inside said elongated tube between said first and second ends;

c. first and second sealed bearing means attached respectively to said first and second ends and rotatably supporting said axially positioned shaft;

d. an input formed through said tube and over said shaft near said first end;

e. an output formed through said tube and under said shaft near said second end; and

f. first and second screw flight means formed along said shaft, said first screw flight means having a selected pitch at said first end and extending into a lesser pitch beneath said input to further extend to said selected pitch at said output and said second screw flight means having selected pitch and extending from said second end to said output, said second screw flight means having a reverse pitch with respect to said first screw flight means.

3,896,924

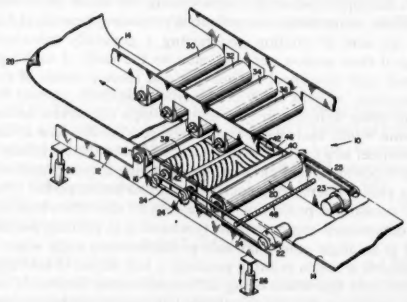
METHOD AND APPARATUS FOR REMOVING FIBROUS PARTICLES FROM A CONVEYOR BELT

Michael A. Sbarra, 95 Narrangansett Ave., Ossining, N.Y.

Filed Sept. 14, 1973, Ser. No. 397,286

Int. Cl. B65g *45/00*

U.S. Cl. 198—230 **9 Claims**



1. A method of dislodging and removing fibrous particles from a resilient conveyor belt surface while the belt is moving comprising the steps of:

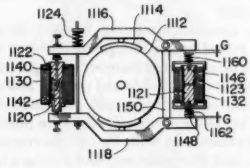
a. juxtaposing a body of liquid comprising substantially water beneath said belt surface at a location along the path traversed by said moving belt;
b. introducing a foam agent into said liquid body to form a wash solution;
c. generating a foam at the surface of said wash solution;
d. scrubbing the surface of said belt as it passes over said wash solution;
e. applying said foam to said belt surface substantially concomitantly with step (d);
f. removing a residue of said foam from said belt surface after it leaves said location.

3,896,925

BRAKING SYSTEM FOR AN ELECTRICALLY-OPERATED ROAD SUCH AS AN ESCALATOR

Tsuyoshi Mitsui; Takeji Hiramoto, and Mitio Imanaka, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 1, 1973, Ser. No. 402,280
Claims priority, application Japan, Sept. 29, 1972, 47-96993; Mar. 28, 1973, 48-34574
Int. Cl. B65g *43/06*
U.S. Cl. 198—232 **23 Claims**



1. A braking system for a power-operated road means for transporting passengers along a vertical component of running, comprising: first means for producing a running direction signal correlated to the running direction of said power-operated road means; emergency switching means for automatically generating an emergency signal when an emergency condition occurs when said road means should be secured against movement; braking means for generating braking force acting to stop said power-operated road means in response to said emergency signal from said emergency switching means; and said braking means including brake force control means, providing an ascent braking force in response to the running direction signal from said first means indicating an ascent road running and providing a descent braking force substantially greater than said ascent braking force in response to the running direction signal from said first means indicating a descent road running.

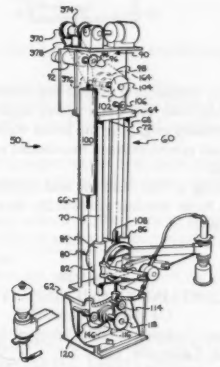
3,896,926

MOTION TRANSLATING APPARATUS AND CONTROLS THEREFOR

Mario Cuniberti, Columbus, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 295,530, Oct. 6, 1972, Pat. No. 3,841,497. This application Nov. 23, 1973, Ser. No. 418,553
Int. Cl. B65g *47/24*
U.S. Cl. 198—241 **9 Claims**

1. Apparatus for controlling relative motion of a plurality of components, comprising
a. an element to be selectively rotated;
b. carrier means for journally supporting said element;
c. means for moving said carrier means to cause said element to travel along a predetermined linear path, said path having a first portion along which said element is not to be rotated and a second portion along which said element is to be rotated;
d. means for rotating said element;
e. means for sensing the position of said element on said linear path and providing a signal when said element is on one of said portions;
f. means responsive to said sensing means signal for connecting said element rotating means to rotate said element when said element is traveling along said second portion of said path;
g. an indexing hub means journally supported in said carrier means;
h. clutch means for selectively connecting said indexing hub means to said element to be selectively rotated;
i. means for actuating said clutch means to selectively connect said indexing hub means to said element to be selectively rotated when said element is traveling in a first direction along said linear path;



j. said element rotating means being connected through said rotatable element to rotate said indexing hub means a predetermined angular amount;
k. means for maintaining said indexing hub means at its angularly rotated position when said element is traveling in a second direction along said linear path;
l. at least one arm extending from said indexing hub means;
m. article grasping means carried on said arm;
n. means for successively supply articles to an article pickup station to be grasped by said article grasping means; and
o. means for synchronizing said article supplying means and the movement of said carrier means to enable the disposition of said article grasping means at said article pickup station when an article has been supplied at said station by said article supplying means.

3,896,927

DISPLAY CARTON FOR TUMBLERS AND THE LIKE

Daniel P. Dutcher, Shoreview, Minn., assignor to Hoerner Waldorf Corporation, Saint Paul, Minn.

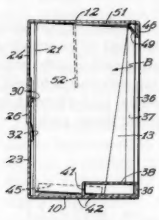
Filed July 2, 1973, Ser. No. 375,779
Int. Cl.[2] B65D *5/50*
U.S. Cl. 206—45.14 **4 Claims**

1. A generally rectangular carton for tumblers including:
a bottom panel, side walls extending upwardly from opposite ends thereof, and a top panel connecting the upper ends of said side walls,
a short front flange extending upwardly from said bottom panel along the forward edge thereof,
a false bottom panel extending into said carton from the upper edge of said front flange,
means supporting said false bottom panel in spaced relation to said bottom panel,

said false bottom panel having spaced notches therein engaging the outer surfaces of said tumblers in spaced relation to the lower ends thereof,

said false bottom panel holding said tumblers from forward movement through the open front side of said carton,

a top liner panel hingedly connected to the front edge of said top panel and folded to underlie said top panel,



tabs foldably connected to said top liner panel extending downwardly into the open upper ends of said tumblers and frictionally engaging the inner walls of said tumblers to hold said tumblers from movement relative to said top panel, and

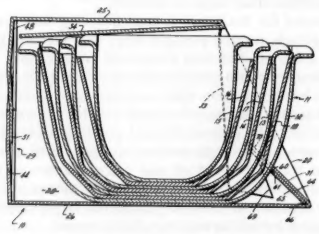
means forming a rear wall on said carton to prevent said tumblers from moving rearwardly away from said false bottom panel.

3,896,928

BOX FOR CONTAINING AND DISPLAYING ARTICLES OF MERCHANDISE

Robert L. Forté, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Aug. 24, 1973, Ser. No. 391,291
Int. Cl.[2] B65D *5/04, 5/50, 85/62*
U.S. Cl. 206—45.14 **4 Claims**



1. A box for containing and displaying a product comprising:

top, side and bottom walls forming a rectangular sleeve having a front and rear end;

end flaps connected to said walls to close the rear end of said sleeve;

a retaining flap hinged to the front end of said bottom wall and projecting at an acute angle to said bottom wall inwardly into said sleeve;

and side flaps hinged to the front end of said side walls, each projecting at an acute angle to said side walls and inwardly into said sleeve;

each said side flap having a slot which receives and locks a side edge portion of said retaining flap;

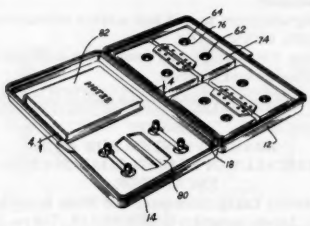
said product being retained by engagement between said end flaps and the inwardly projecting edge of said retaining flap.

3,896,929

MOLDED CASE FOR CASSETTES

Thomas C. Mills, 827 Golf Ln., Wheaton, Ill. 60187

Filed Feb. 14, 1973, Ser. No. 332,367
Int. Cl. B65d *85/672*
U.S. Cl. 206—387 **9 Claims**



1. A container for tape cassettes comprising, in combination:

a first wall of flexible material, at least one slot in said wall with a wide end portion connected to a relatively narrow intermediate portion;

a second wall opposed to and spaced from the first wall and the slot; and

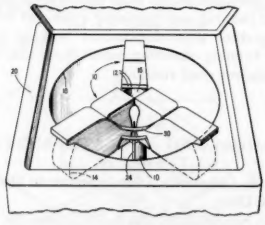
a separate cassette mounting bracket in said slot, said bracket including an elongated member with a bottom surface, said elongated member having a width intermediate the width of said wide end portion and said intermediate portion of said slot, said elongated member being inserted in said slot through said wide portion for maintenance between said walls by the intermediate portion of said slot, said elongated member having a length less than the length of the slot, said bracket also including a cassette reel engaging stud projecting outwardly from said elongated member and extending from said slot for engagement with a tape reel.

3,896,930

WASHING MACHINE AGITATOR BRACE

Herbert S. Collin, 56 Bristol St., Newton, Mass. 02118

Continuation-in-part of Ser. No. 209,551, Dec. 20, 1971, abandoned. This application Aug. 28, 1972, Ser. No. 284,208
Int. Cl. B65d *81/06, 85/00*
U.S. Cl. 206—320 **13 Claims**



1. A bracing device for a top-loading clothes washing machine having an agitator element comprising:

an elongate member formed from a relatively rigid foam plastic material, said member having an inner end and an outer end, said inner end being adapted to engage said agitator and the outer end being adapted to engage the rim of the opening in said washing machine so that when said brace is used it extends radially and outwardly from said agitator; and

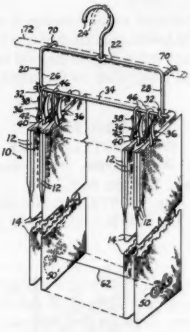
means forming a lip at at least one end of said brace, said lip having an undersurface for engaging an edge of a

portion of said machine, said undersurface being formed at an incline to the horizontal and being of a configuration which does not conform to the configuration of said edge of a portion of said machine, said foam plastic material being relatively crushable whereby said inclined undersurface of said lip may be wedged downwardly against said edge portion of said machine to permanently deform said undersurface and form a permanent pocket receptive to and engaged with said edge portion of said machine, said pocket having a configuration conforming to said edge portion of said machine.

3,896,931
DRAPERY HOLDER

Edna M. Franklin, 1500 N.W. 35, Oklahoma City, Okla. 73118

Filed Aug. 9, 1973, Ser. No. 387,085
Int. Cl. B65d *85/00*
U.S. Cl. 206—326 **2 Claims**



1. In a hanger for a drapery panel having a plurality of pleated folds formed in one marginal edge portion and having the pleat folds arranged vertically in juxtaposition, the improvement comprising:

a downwardly open vertically planar wire loop frame including a pair of depending legs defining the opening;

a pair of support arms connected with said frame legs in horizontal laterally projecting parallel relation;

a J-shaped suspension hook pivotally connected by its shank portion with said frame opposite the opening;

a shaft extending horizontally across the opening of said frame;

means, including a J-shaped loop formed on the depending end of each said leg and projecting laterally of the frame plane, removably connecting said shaft with said frame;

a plurality of drapery pleat fold gripping clamp means supported by said shaft,

said clamp means including a spring clamp clothespin comprising a pair of cooperating clamp members movable at their respective ends toward and away from each other and having the intermediate portion of a spring helically wound and transversely interposed between the clamp members intermediate the ends of the latter, and,

a closed wire loop projecting through the helical portion of said spring and loosely slidably surrounding said shaft;

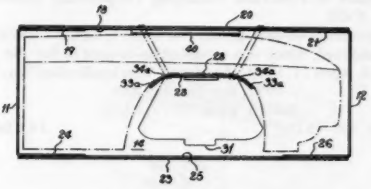
a pair of frabric retainer plates respectively contacting the outermost surface of the depending end portion of said drapery panel and cooperating with said clamp means in maintaining said drapery panel folds juxtaposed; and,

a thread extending through the material of said drapery panel between and connected at its respective ends with said pair of retainer plates.

3,896,932
FENDER CARTON

Ernest W. Giebel, Monroe, Mich., and Robert W. McCormick, Columbus, Ohio, assignors to Union Camp Corporation, Wayne, N.J.

Filed Nov. 12, 1973, Ser. No. 414,758
Int. Cl.² B65D *85/68, 81/02, 85/30*
U.S. Cl. 206—335 **2 Claims**



1. A carton for packaging a fender comprising:

a bottom;

side and end panels secured to the bottom;

a cut out in each side panel which is hinged along a score line to said side panel and folded normal to said side panel;

said cut outs being superimposed on each other and extending to the opposite side panel to form a saddle of double thickness;

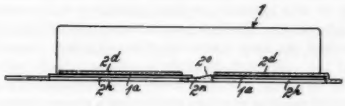
said saddle being scored at the ends to form a saddle of arcuate form and being locked in position for supporting the fender; and,

top closure means for closing the top of the carton.

3,896,933
DISPLAY PACKAGING UNIT FOR PACKAGING AND DISPLAYING SMALL PARTS

Ulrich Bockemuhl, Ludenscheid, Germany, assignor to Spritzguss-Werk Ludenscheid G.m.b.H., Ludenscheid, Germany

Filed June 29, 1973, Ser. No. 375,232
Claims priority, application Germany, July 1, 1972, 2232494
Int. Cl.² B65D *73/00*
U.S. Cl. 206—469 **6 Claims**



1. A packaging unit of synthetic resin for storing small parts including a transparent prismatic container having integral outwardly projecting flanges and a substantially plate-shaped cover for said container having parallel slide guide ribs engaged by said flanges of said container and allowing a relative rectilinear motion of said cover and said container, said cover having a perforation outside the area thereof encompassed by said container to allow suspension of said unit by means of said perforation, and said cover having abutment means limiting the extent of said relative motion of said cover and said container, wherein the improvement comprises a flexible tab adapted to form a latch and a tab-receiving aperture adapted to be engaged by said latch-forming tab when said container is closed by said cover and said tab-receiving aperture and said latch-forming tab are in registry, said latch-forming tab and said tab-receiving aperture being formed by portions of said slide guide ribs of said cover and by portions of said flanges of said container, and said latch-forming tab being arranged in such a way that it snaps into said tab-receiving aperture incident to closing of said container by said cover and is fractured

incident to a rectilinear opening motion of said cover relative to said container.

3,896,934

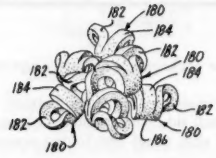
FREE FLOW, INTERLOCKING PACKING MATERIAL OF LOW BULK DENSITY

Arthur Graham, Palo Alto, Calif.; Alexander G. Makowski, Wilmington, Del., and Gunter G. Fuss, Daly City, Calif., assignors to Free-Flow Packaging Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 82,697, Oct. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 815,302, April 11, 1969, abandoned. This application Nov. 24, 1972, Ser. No. 309,459

Int. Cl. B65d *81/12, 85/30*

U.S. Cl. 206—523 **14 Claims**



5. As an article of manufacture, a shipping carton for frangible items, such carton being substantially completely filled with a packing mass comprised of a plurality of individual packing units formed of a foamed substantially rigid expanded plastic material, said plastic material possessing sufficient internal strength to be self-sustaining under normal handling but capable of substantial crushing in response to external force, each of said individual packing units consisting of a central substantially cylindrical annular portion and two outwardly curling annular portions substantially permanently secured to said central portion and to one another at a peripheral portion thereof, said portions being characterized by a foam structure which has been expanded substantially greater in a radial direction than in an axial direction so as to provide enlarged wedge-shaped openings between said portions, the foam structure of said packing units at said peripheral portion being relatively stronger in the axial direction and sufficiently rigid to prevent articulation between said outwardly curling portion and said central substantially cylindrical portion, the positioning of said annular portions providing wedge-shaped openings adapted to interlock with at least one of the other said individual packing units, said interlocking extending throughout the said packing mass to cooperatively prevent migration of an article packed therein, said respective curling and cylindrical annular portions presenting a shape configuration wherein outermost portions thereof are substantially equidistant from the geometric centers of said individual packing units.

3,896,935

INTEGRATED CIRCUIT HANDLER

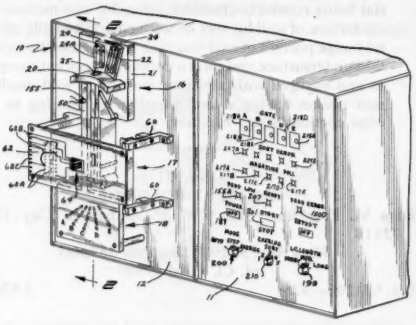
Harold N. Hjelle, New Brighton, and Jack S. Soebbing, St. Paul, both of Minn., assignors to Ramsey Engineering Company, St. Paul, Minn.

Filed Nov. 26, 1973, Ser. No. 418,990

Int. Cl. B07c *5/344*

U.S. Cl. 209—73 **6 Claims**

1. An integrated circuit handling machine for handling and sorting integrated circuit chips, including means for supplying circuit chips to be tested in an upright column, first means to retain said column by retaining the lower chip in a holding position, a plurality of selectively operable second means each being operable to selectively retain from downward movement a second chip in said column and all chips in the column above the second chip, means to select and render operable one of said second means, each of said selectively operable second means being positioned to engage a second chip of a stack of chips of different length than the chips used with the other second means means to selectively release said first



means while one of said second means is retaining a second chip to permit said lower chip to move, a chip testing station on said machine and guide means on said machine positioned to guide a released lower chip to the testing station.

3,896,936

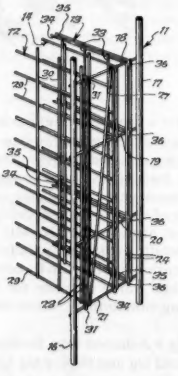
WINE BOTTLE RACK

Burton Notarius, Williamsville, N.Y., assignor to Premier Party Goods, Inc., Buffalo, N.Y.

Filed Apr. 1, 1974, Ser. No. 456,559

Int. Cl.[2] **A47B** *73/00;* **A47F** *5/10*

U.S. Cl. 211—74 **4 Claims**



1. In a rack for wine bottles and the like, a pair of end members each comprising front and rear vertical posts and a plurality of vertically spaced cross rods welded at their ends to said posts to form a unitary end member, a plurality of laterally extending grid members engageable at their side edges with said end members, said grid members comprising a front member, a rear member and an intermediate member, said members each comprising a vertical series of spaced horizontal rods and a lateral series of vertical rods welded at the rod intersections to form a rigid grid arrangement, the rods of the front and intermediate members forming spaces for receiving individual bottles, the vertical rods of the rear grid members being staggered with respect to the vertical rods of the front and intermediate members whereby the bottoms of bottles stop against said rear member vertical rods, certain of the horizontal rods of said grid members having laterally projecting downwardly opening hook formations formed inte-

grally therewith for engagement over the cross rods of the end members, the vertical rods at the ends of said grid members being disposed inwardly of said hook formation at such distance that the hook formations and the end vertical rods fit over the cross rods to prevent lateral movement of the end members, and means on said end members comprising abutting surfaces at each side of each hook formation for preventing substantial movement of said hook formations relative to said end members in a fore and aft direction.

3,896,937

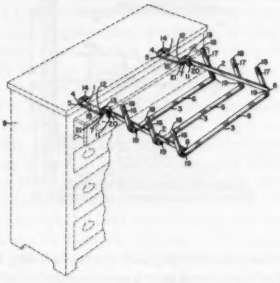
MULTI PURPOSE BEDROOM HANGER

Anthony J. Christian, 100-Parker Rd., Rochester, N.Y. 14617

Filed Oct. 1, 1973, Ser. No. 402,274

Int. Cl.[2] A47F *5/00*; **A47J** *51/142*

U.S. Cl. 211—86 **2 Claims**



1. A lever type hanger whose short lever arms include integral U shaped fulcrums with protective linings on the inside faces of said U shaped fulcrums and extending from said fulcrums paralell to one another, also being on the same plane as the short lever arms, are long lever arms connected transversely to the closed portion of elongated U shaped crossbars positioned with the sides of the U extending angularly from the long lever arms 2 as prongs.

3,896,938

DEVICE FOR COMPENSATING CARRIAGE WEIGHT ON GANTRY OR CANTILEVERED MACHINE TOOLS

Edmund Eich, and Gunter Briesofsky, both of Coburg, Germany, assignors to Werkzeugmaschinenfabrik Adolf Waldrich Coburg, Coburg, Germany

Filed Feb. 1, 1973, Ser. No. 328,863

Claims priority, application Germany, Feb. 11, 1972, 2206641

Int. Cl. B66c *19/00*

U.S. Cl. 212—26 **4 Claims**

1. A device for compensating for the weight of a carriage movably mounted on a transverse beam mounted on and extending between a pair of horizontally spaced uprights to maintain said transverse beam and said carriage at a predefined vertical level, comprising:

stationary support means mounted on and extending between said pair of uprights parallel to said transverse beam;

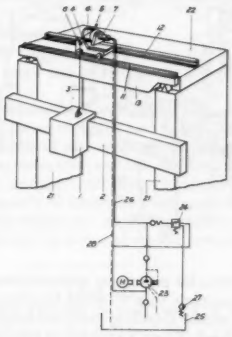
trolley means mounted on said support means for movement back and forth parallel to said transverse beam in synchronism with said carriage;

cable means and winch means therefor mounted on said trolley means, said cable means being secured to and extending between said winch means and said carriage and is always under a constant tension force;

hydraulic motor means drivingly connected to said winch means;

hydraulic pump means connected in fluid circuit to said hydraulic motor means for supplying pressurized hydraulic fluid to said hydraulic motor means; and

adjustable pressure controlling means connected in fluid circuit to said fluid circuit between said hydraulic pump means and said hydraulic motor means to maintain a constant pressure in said fluid circuit and thence on said hydraulic motor means, whereby said constant pressure on said hydraulic motor means effects a constant torque



on said winch means and, consequently, said cable means, said hydraulic motor means also defining a sensing means for sensing rotational movement of said winch means occurring when said transverse beam is moved from said predefined vertical level and producing a fluid flow signal, said adjustable pressure controlling means controlling said pressure in response to said fluid flow signal, whereby said carriage will be maintained at said predefined vertical level as said trolley means and said carriage move between said uprights.

3,896,939

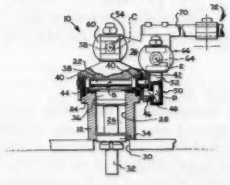
TRANSFER MECHANISM

William O. Harris, 414 Bristol Dr., Harrisburg, Pa. 17109

Filed Apr. 24, 1974, Ser. No. 463,437

Int. Cl.[2] B65G *29/00*

U.S. Cl. 214—1 BH **8 Claims**



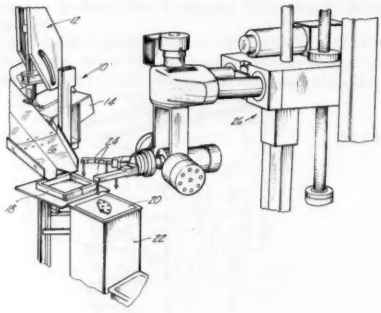
1. A transfer mechanism including work piece transfer means for moving a work piece along a surface, said means including holding means for the work piece during motion on said surface; and control means for limiting the movement of said holding means to movement along a curve on the surface having a cusp so that all motion of the holding means is smoothly brought to an instantaneous stop at the cusp.

3,896,940

PART PRESENTER

Kirk E. Birrell, Bellbrook, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 30, 1974, Ser. No. 438,075
Int. Cl.[2] B65G *59/04*
U.S. Cl. 214—8.5 D **14 Claims**



1. Appparatus for presenting selected parts from a plurality of storage locations to a terminal location comprising: part conveyance means directing parts received to said terminal location; support means; a plurality of storage bins removably disposed on the support means at spaced points adjacent said part conveyance means; a plurality of part transfer devices disposed on said support means over said bins and separately actuable for transferring parts from said bins to said conveyance means, each of said transfer devices including part pickup means and an actuator means for selectively displacing the pickup between a first position within a storage bin for part pickup and a second position over said part conveyance means for part release thereinto and control means for causing the pickup means to automatically cycle from the second position to the first position and back immediately after releasing a part onto said part conveyance means; said apparatus further including means maintaining each of said pickup means in said second position until a release signal is received from said control means to release a selected part onto said part conveyance means.

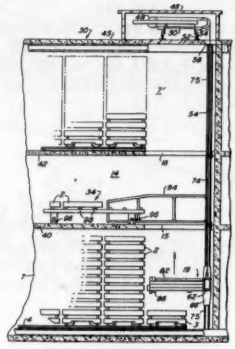
3,896,941

MULTISTORY BUILDING WITH A MATERIAL HANDLING ELEVATOR APPARATUS HAVING FIXED AND MOVABLE TRACKS

Jorg Kuhn, Alpsteinstrasse 56, Herisau, Switzerland, and Elmar Sohm, Vorarlberg, Lauterach, Austria

Division of Ser. No. 197,432, Nov. 10, 1971, Pat. No. 3,717,953, and a continuation-in-part of Ser. No. 4,918, Jan. 22, 1970, abandoned. This application May 18, 1972, Ser. No. 254,556
Int. Cl. B65g *1/06*
U.S. Cl. 214—16.4 A **5 Claims**

1. Apparatus comprising a multistory building having at least first and second elevations, said building including a horizontal floor between said elevations, said floor having spaced openings, said building at its first elevation having a plurality of parallel chambers each communicating with said second elevation by way of at least one of said spaced openings in said floor, a conveyor on the second elevation generally parallel to the chambers for processing items stored in the chambers, and an elevator frame for moving items between the first and second elevations, vertically disposed tracks, said elevator frame being guided for vertical movement by said tracks, said frame having a gripper means, motor means on said frame for moving said gripper means between an extended and retracted horizontal position, said gripper means including elements movably supported for movement from an inoperative retracted position to an operative extended position wherein the elements can embrace and support a receptacle in each of said positions and as the receptacle is moved vertically by the frame, said floor supporting the elevator frame for movement in a horizontal direction at said second elevation so that the frame may be juxtaposed to and enter through different ones of the openings in the floor between the



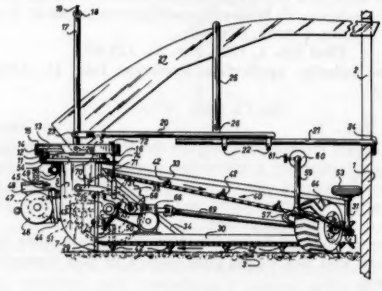
first and second elevations, said conveyor being supported by said floor for movement in a transverse direction, guard rails, a portion of said tracks being connected to said guard rails and movable with the conveyor when the elevator frame is between the guard rails, said tracks include stationary portions at said first elevation in each chamber, and said movable portion of said tracks being adapted to be aligned with each set of stationary tracks.

3,896,942

SILO UNLOADER

Gérard Couture, Danville, and Gratien Houle, Wickham, both of Canada, assignors to Wic Inc., Wickham, Canada

Filed Aug. 22, 1973, Ser. No. 390,606
Int. Cl. A01f *25/16*
U.S. Cl. 214—17 DB **6 Claims**



1. A silo unloader for use in a silo having an upright silo wall with a side opening therein, comprising in combination an impeller duct means having a silage inlet, a silage outlet and an interior silage passage extending from said silage inlet to said silage outlet, frame means fixed to said impeller duct means and extending away therefrom, a first rotary member mounted adjacent said silage inlet, a second rotary member mounted onto said frame means on an axis parallel to the axis

of said first rotary member and spaced laterally therefrom, endless conveyor means engaging around said first and second rotary members and arranged to rotate therewith, a series of scoops attached to said endless conveyor means in spaced-apart relationship relative to each other and forming part of said endless conveyor means and constructed and arranged to scoop and scrape silage towards said silage inlet and to describe a circumferential path around the axis of said first rotary member and to impel the scooped silage in said interior silage passage towards said silage outlet, drive means connected to one of said rotary members and arranged to rotate the latter and said endless conveyor means, impelling blades operatively connected to said first rotary member for bodily rotation therewith in circumferentially spaced-apart relationship corresponding to the spaced relationship of said scoops, and in side-by-side registry with the latter when travelling along said circumferential path, whereby to increase the impelling action on the scooped silage, said frame means further comprising a remote frame portion relative to said impeller duct means, said second rotary member is rotatably mounted onto said remote frame portion and a traversing bogey frame is articulately attached to said remote frame portion and is arranged to traverse the latter and said endless conveyor means over the silage in the silo, wherein said blades are fixed against the opposite sides of said first rotary member and extend radially therefrom in transversely aligned pairs arranged to register and to straddle the scoops which are actually travelling along said circumferential path, and

wherein said first and second rotary members are a first and a second sprocket wheel respectively, said impeller duct means is constructed and arranged to be used in upright position and defines an upright side wall, said silage inlet is a silage inlet opening extending through the bottom portion of said side wall, said first sprocket wheel is rotatably mounted into said silage inlet opening, said silage outlet is a silage outlet opening provided above said silage inlet opening, said circumferential path extends upwardly into said interior silage passage from said silage inlet opening towards said silage outlet opening, said endless conveyor means includes an endless chain, and the latter and said sprocket wheels are rotatably mounted in an upright plane intersecting said impeller duct means.

3,896,943

APPARATUS FOR UNLOADING MATERIAL SUCH AS CHIPS OR THE LIKE FROM THE BOTTOM OF A SILO

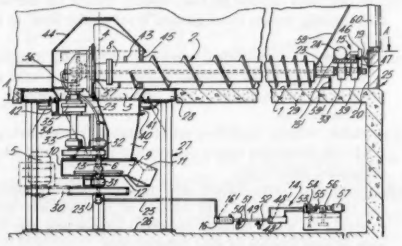
Roald Willies Knutsen, Arendal, Norway, assignor to Saxlund A/S, Risor, Norway

Filed Sept. 25, 1973, Ser. No. 400,513

Claims priority, application Norway, Sept. 27, 1972, 3459/72

Int. Cl. B65g *65/46*

U.S. Cl. 214—17 DA **8 Claims**



1. In apparatus for unloading material such as chips or the like from the bottom of a silo having a bottom outlet orifice, comprising a conveyer screw, an annular frame surrounding the outlet orifice in the bottom of the silo and having said screw mounted thereon, said frame being arranged for rotation about the central axis of the silo for allowing swinging of said screw along the bottom of the silo,

a motor mounted stationarily independently of said rotary frame for rotating said screw about its longitudinal axis for conveying material to said outlet orifice,

a drive shaft extending along said central axis for effecting power transmission between stationary motor and the rotary screw,

a hydraulic device provided at the outer end of said screw and cooperating with the inner circumference of the silo, a stationary source of hydraulic motive fluid outside the silo, said source communicating with said hydraulic device,

the improvement comprising:

an outlet funnel carried by said rotary frame and located beneath the inner end of said screw and offset from its central axis,

a stationary container through which said shaft extends centrally and down to which said rotary outlet funnel is leading, the walls of said container having an increasing distance from the central axis to a substantially tangential lateral outlet, and said shaft having a central bore through which said source of hydraulic fluid communicates with said hydraulic device for supplying motive fluid to the latter for driving the screw along the bottom of the silo.

3,896,944

APPARATUS FOR TRANSFERRING WASTE MATERIAL FROM REFUSE COLLECTING TRUCKS TO A TRANSPORT VEHICLE

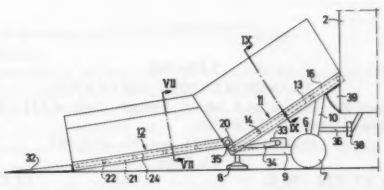
Sten Esse Torgild Idoffsson, Kovlinge, S-310 26 Vallberga, Sweden

Filed Feb. 6, 1974, Ser. No. 439,881

Claims priority, application Sweden, Feb. 7, 1973, 7301659; Dec. 7, 1973, 7316559

Int. Cl. B65g *67/08*

U.S. Cl. 214—41 **13 Claims**



1. Apparatus for transferring waste material from refuse collecting trucks to a transport vehicle having a container for compressing the waste material and for transporting the waste material to a dumping-ground, said apparatus comprising a conveyor for transferring the waste material from the refuse collecting trucks into the container of the transport vehicle, said conveyor having:

A. a first conveyor section mounted on a wheeled stand and connectable to the transport vehicle, said first conveyor section having:

1. a first motor driven endless conveyor element, and

2. two substantially vertical side walls pivotably connected to fixed structure of the first conveyor section so as to be foldable over said first conveyor element.

B. a second conveyor section pivotably mounted to the first conveyor section and having:

1. a second motor driven endless conveyor element, and

2. two substantially upwardly and outwardly directed side walls pivotably connected to fixed structure of the second conveyor section so as to be foldable over said second conveyor element, said second conveyor section with its side walls folded over the second conveyor element being also foldable over said first conveyor

section so as to form a small trailer towable by the transport vehicle.

3,896,945

BOTTOM DUMPING RAILWAY HOPPER CAR

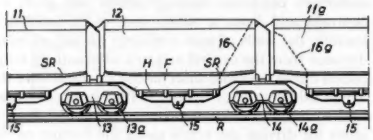
Anders Bjorklund; Bert Frelin, and Sven Scott, all of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed June 19, 1973, Ser. No. 371,549

Claims priority, application Sweden, June 26, 1972, 008361/72

Int. Cl. B61d *7/18, 7/30;* **B61f** *3/12*

U.S. Cl. 214—63 **1 Claim**



1. A railroad bottom-dumping gondola car comprising a rectangular frame, a gondola body supported by said frame and having a bottom closed by a downwardly swinging door, and railroad wheels normally supporting said frame on railroad tracks, said frame having sides from which longitudinally extending side rails laterally project for running on rollers supporting said frame with said wheels free from railroad tracks during downward swinging of said door for dumping operation; wherein the improvement comprises said side rails being positioned along the upper edges of the frame's said sides so that the frame is suspended by the side rails while they run on said rollers.

3,896,946

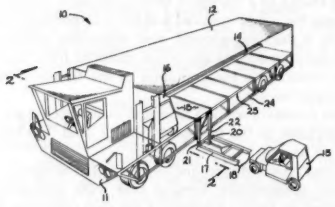
TRANSPORTATION APPARATUS

Robert W. Forsyth, and John P. Forsyth, both of 1517 N. 3rd Ave., Upland, Calif. 91786

Filed Oct. 2, 1972, Ser. No. 293,797

Int. Cl. B60p *1/44*

U.S. Cl. 214—75 G **14 Claims**



1. In a carrier apparatus for transportation of a plurality of passenger vehicles or the like comprising the combination of:

a roadable vehicle including an elongated deck having a cab disposed on the forward end thereof and a storage compartment disposed immediately behind said cab and extending to the aft end thereof;

loading means carried on the side of said deck including a pair of spaced-apart vertical members movably carried on a pair of longitudinally disposed vertically spaced-apart side rails depending from said deck;

a platform pivotally carried on said vertical members;

powered means for extending said platform outward so as to cantilever from said vertical members and for folding said platform so as to be adjacent said vertical members; means operatively carried beneath said deck for moving said loading means along said deck adjacent said storage compartment;

means operably carried on said loading means for elevating said loading means from ground level to the level of said deck;

said storage compartment includes a curb extending the full length of said storage compartment of said deck dividing said compartment into a pair of storage areas and wherein each storage area includes a plurality of laterally elongated storage spaces;

said moving means includes means for aligning said loading means with a selected one of said storage spaces for accommodating transfer of a load from said loading means to said selected storage space;

said load constitutes said passenger vehicle and wherein said vehicle includes means for extending and shortening its overall length of said selected storage space;

said last mentioned means includes a front extendable portion of said passenger vehicle having steered wheels mounted thereon and a rear non-movable portion having a steering wheel mounted thereon;

a slidable connection means operable between said steering wheel and said steered wheels allowing steering at any position of said front steered wheels;

means for limiting the extension and retraction of said front portion; and

said limiting means being shearable under excessive predetermined load impact.

2. A transportation system adapted to use combined or independently in common existing highways, freeways, expressways, and surface streets comprising the combination of:

a self-propelled, self-loading carrier apparatus adapted to the transportation of a plurality of variable-wheelbase passenger vehicles including the occupants thereof;

said self-propelled, variable-wheelbase passenger vehicles adapted to independent operation and to conveyance with their occupants in a combined grouping on said carrier apparatus;

said self-propelled, self-loading carrier apparatus comprises the combination of:

a roadable vehicle including an elongated deck having an operator's cab disposed on the forward end thereof and a storage compartment disposed immediately behind said cab and extending to the aft end of said deck;

loading means carried on the side of said deck;

means operatively carried beneath said deck for moving said loading means along aforesaid deck adjacent said storage compartment; and

means operably carried on said loading means for elevating said loading means from ground level to the level of said deck; and

one of said self-propelled, variable-wheelbase passenger vehicles adapted to be loaded and carried on said self-propelled, self-loading carrier apparatus comprising the combination of:

a roadable vehicle including an elongated frame having an enclosed passenger space disposed thereupon and wheels depended therefrom;

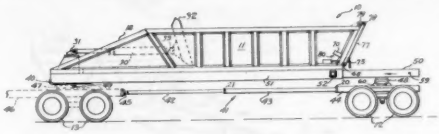
said elongated frame having rear portion operably supporting the rear pair of said wheels of said vehicle and a movable forward portion operably supporting the front pair of said wheels of said vehicle; and

power means operably interconnected between said rear portion and said forward portion of said elongated frame of said vehicle for selectively moving said forward portion away from and toward said rear portion so as to extend and shorten the wheelbase and overall length of said vehicle.

3,896,947
SPREADING AND END SPILL DUMP TRAILER

Arthur W. Pearce, 275 Lk. Desire Dr. North, Renton, Wash. 98055

Division of Ser. No. 275,058, July 25, 1972, Pat. No. 3,847,405. This application Nov. 23, 1973, Ser. No. 418,268
Int. Cl.[2] B60P *1/00*
U.S. Cl. 214—82 3 Claims

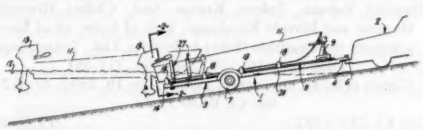


1. An improved trailer for highway hauling and dumping materials, comprising:
a. a main load bearing frame member;
b. a sliding frame member telescopically engageable with said main frame member;
c. a set of rear bogies;
d. means connecting said rear bogies to said sliding frame member;
e. means for locking said sliding frame member with respect to said main frame member in at least two preselected positions;
f. a load carrying box having side walls, a tailgate and a floor mounted on said main frame member so that the bottom of said tailgate is substantially coincident with the rearmost portion of said main frame member;
g. hydraulically actuated rejection gate means for rejecting at least a portion of said load out of said box through said tailgate, said tailgate being hinged to the sides of said box and extending downwardly and frontwardly at an acute angle with respect to the vertical; and
h. tailgate flow regulation means comprising adjustment chain means, spring loaded tension means mounted on said box sides connected to said chain means for imparting tension to said chain means, and means mounted on said tailgate having passage means through which said chain means passes for selectively locking said chain under a desired amount of tension.

3,896,948
BOAT TRAILER ADJUSTABLE GUIDE STRUCTURE

Kelly D. Finney, Rt. 2, Box 531-A, Chico, Calif. 95926

Filed Oct. 26, 1973, Ser. No. 409,870
Int. Cl.[2] P60P *1/00*
U.S. Cl. 214—84 7 Claims

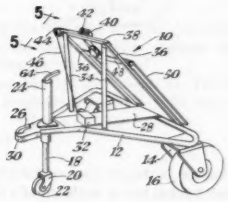


1. Adjustable guide structure for a boat trailer which includes a chassis having laterally spaced frame members extending longitudinally thereof, said guide structure comprising
A. a pair of laterally spaced opposed generally upright guide posts positioned adjacent the rear end of said trailer, and
B. means mounting each of said guide posts on an associated frame member, comprising
1. mounting structure adjustably securing each said post to its associated frame member so that the lateral spacing of said posts relative to each other may be selectively varied in accordance with the width and contour of the hull of the boat to be carried on said trailer, said mounting structure comprising
a. a mounting plate engaged with one side of said associated frame member,
b. a pair of U-bolt and nut fasteners traversing said associated frame member and passing through said mounting plate,
c. an end portion of said post being positioned through said U-bolts and held thereby against the opposite side of said frame member, and
d. a shim member interposed between said side of said frame member and said post end whereby the axis of said post is inclined relative to the vertical.

3,896,949
HOISTING AND TOWING DOLLY

Michael T. Shipley, 125 N. Riverside Dr., Pompano Beach, Fla. 33062

Filed Dec. 5, 1973, Ser. No. 421,803
Int. Cl. B60p *3/12*
U.S. Cl. 214—86 A 2 Claims

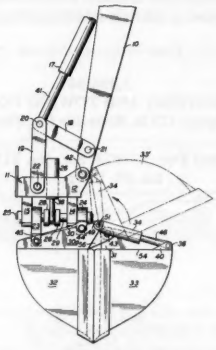


1. A hoisting and towing dolly comprising:
a frame;
a plurality of wheels coupled to said frame for supporting said frame in a substantially horizontal position;
a pair of vertical support members connected to said frame;
a pair of inclined guide rails connected at their upper ends to respective vertical support members and at the lower ends to the frame;
a cross-brace connected between the upper ends of said vertical support members;
a first pair of pulleys connected substantially centrally to said cross-brace and lying in a plane parallel to the inclined guide rails;
a pair of flexible sling members moveably connected to said guide rails;
a sling cross-bar connecting said flexible sling members together at one end;
a second pair of pulleys disposed centrally of and connected to said sling cross-bar, said second pair of pulleys lying in the same plane as said first pair of pulleys and substantially in line therewith;
a cable disposed through said first pair of pulleys and said second pair of pulleys and connected at one end to said vertical support cross-bar;
means connected to said frame for moving said cable, said cable connected at its other free end to said cable moving means;
a vehicle connecting means disposed at one end of said frame; and
a third pulley connected to one of said guide rails, said cable engageable through said pulley, the plane of said third pulley lying in a substantially vertical plane relative to the frame.

3,896,950
EXCAVATING MACHINE

Willard E. McCain, 6431 W. Heidlier Rd., Fairview, Pa. 16415

Filed Jan. 2, 1974, Ser. No. 429,533
Int. Cl.[2] E02F *3/30*
U.S. Cl. 214—138 R 10 Claims

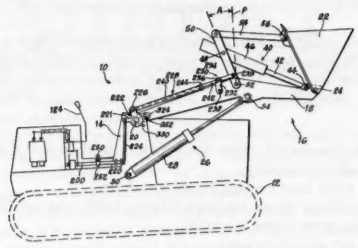


1. In combination, a dipper stick and a clamshell bucket,
said clamshell bucket being made up of a first bucket member and a second bucket member,
a bucket support,
said dipper stick being swingably connected to said bucket support,
means to swing said bucket support relative to said dipper stick,
axially spaced downwardly extending lugs fixed to said bucket support,
said first bucket member having two first spaced axially extending flanges fixed thereto and two second spaced axially extending flanges fixed thereto and disposed between said first axially extending flanges,
said second bucket member having two spaced lugs fixed thereto,
and two third spaced axially extending flanges fixed to said second bucket member and disposed between said lugs on said second bucket member and,
upwardly extending lugs fixed to said first bucket member and disposed between said second axially extending flanges,
means connecting said lugs on said second bucket member to said second flanges on said first bucket member,
king pin means extending through said downwardly extending lugs and through said upwardly extending lugs,
said king pin means being fixed to said upwardly extending lugs,
crank means fixed to said king pin means and
first hydraulic cylinder means connected to said bucket support and said crank means for swinging said bucket about said king pin means,
means swingably connecting said first flanges and said third flanges whereby said second bucket member is swingably connected to said first bucket member,
and second hydraulic cylinder means connected to said first flanges and to said lugs on said second bucket member for swinging said second bucket member relative to said first bucket member.

3,896,951
METHOD FOR POSITIONING BUCKET LOADER

David H. Seaberg, Burlington, and Paul J. Purdy, New London, both of Iowa, assignors to J. I. Case Company, Racine, Wis.

Division of Ser. No. 58,588, July 27, 1970, Pat. No. 3,713,557.
This application Mar. 31, 1972, Ser. No. 239,876
Int. Cl. E02f *1/00*
U.S. Cl. 214—152 3 Claims



1. A method of controlling the angular orientation of a material handling unit relative to a fixed reference plane while the unit is pivotally supported on a boom and the unit is raised and lowered by swinging the boom about a fixed pivot axis and in which the unit is pivoted on a boom by moving a control valve in opposite directions from a neutral condition to supply fluid from a source to a ram located between the unit and boom and movement of the control valve is controlled by a manually controlled lever operatively connected to the valve and a sensing mechanism interposed between the valve and unit, comprising actuating said control valve by said manual control lever to supply fluid to said ram while simultaneously disconnecting the sensing mechanism from the control valve so that said control valve is controlled by said lever independent of the sensing mechanism, returning said control valve to a neutral condition with said lever and simultaneously setting the sensing mechanism to maintain the unit at one of a plurality of angular orientations relative to the fixed reference plane, sensing any deviations of the unit from the selected angular orientation with the sensing mechanism which results from swinging the boom; and actuating the control valve with the sensing mechanism to supply fluid to said ram and maintain the unit at the selected angular orientation.

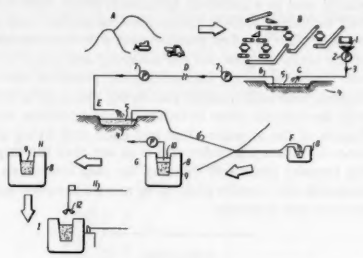
3,896,952
METHOD FOR UNLOADING AN IRON ORE BEING IN A STATE OF A CONSOLIDATED AND HARDENED BODY AND A GRAB-BUCKET FOR USE IN THE SAME

Tsuyoshi Yokota, Tokyo; Koetsu Asai, Chiba; Hisamitsu Harada, and Hiroshi Kominami, both of Kobe, all of Japan, assignors to Mitsubishi Heavy Industries, Ltd., Tokyo, Japan

Filed June 19, 1973, Ser. No. 371,461
Claims priority, application Japan, June 19, 1972, 47-61241
Int. Cl. B63b *27/24*
U.S. Cl. 214—152 12 Claims

1. A method for unloading iron ore from the hold of a shipping vessel, comprising the steps of:
loading said iron ore into said hold of said shipping vessel while in a slurry state;
permitting said iron ore to consolidate and become a dry and hardened body;
dropping a grab-bucket having a pair of shells held in their opened position, utilizing its gravity, onto said consolidated and dried hardened body contained in the hold of said vessel so as to thereby demolish said body;
closing said pair of shells to grab a portion of said body thus demolished, and thereafter lifting said grab-bucket so as to unload the dried demolished body thus grabbed within

said pair of shells in their closed position; and



transferring said unloaded demolished body to a suitable transport medium whereby said demolished body may be further processed.

3,896,953

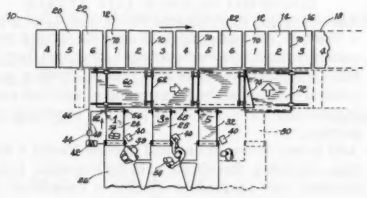
METHOD OF LOADING ARTICLES ON A CONVEYOR

John Harrison, Lincolnwood, Ill., assignor to The Spra-Con Company, Chicago, Ill.

Division of Ser. No. 266,320, June 26, 1972, abandoned, which is a continuation of Ser. No. 45,174, June 9, 1970, abandoned. This application Oct. 4, 1973, Ser. No. 403,481

Int. Cl. B65g *43/00*

U.S. Cl. 214—152 4 Claims



1. In a method for conveying articles from one position to another including a conveyor, a plurality of separate, individually defined, article carrying areas defined by the conveyor, a plurality of loading stations, a plurality of article transfer means positioned for receiving articles from loading stations, said transfer means including an article supporting surface, and article engaging means for contacting the articles and for moving the articles along the supporting surface to a transfer position for movement thereat of the articles from the supporting surface to the article carrying areas of the conveyor, said method comprising the steps of:

a. locating said loading stations in at least two groups and positioning each group at a separate location relative to each other group, each group including at least two loading stations;

b. transferring articles from each loading station to a specific position on a transfer means whereby each loading station transfers articles to a different surface portion of a transfer means;

c. moving said article engaging means over said surfaces of said transfer means at the same speed as said article carrying areas of said conveyor whereby each article placed on the transfer means is moved by an article engaging means at the same speed as an article carrying area;

d. said article carrying areas being divided into sets with each set receiving articles from a particular group of loading stations, and locating the article carrying areas designated for the loading stations of one group in regular, alternating positions with respect to article carrying areas designated for loading stations of each other group;

e. controlling the spacing between article engaging means for each transfer means to a distance substantially equal to the spacing between center points of succeeding article carrying areas in a set whereby said spacing between article engaging means is at least about equal to or greater than the distance between center points of the first and third areas of a group of three adjacent article carrying areas;

f. moving the article engaging means associated with one group of loading stations whereby articles passed from each loading station of that group are moved in synchronized timed relationship only with respect to article carrying areas designated for that group; and,

g. aligning each article engaging means of a group with a particular article carrying area designated for that group whereby each article engaging means is in a pair with a particular article carrying area with the respective members of each pair arriving substantially simultaneously at the transfer point whereby articles moved by the article engaging means for that group are moved only to article carrying areas in the set designated for loading stations in that group.

3,896,954

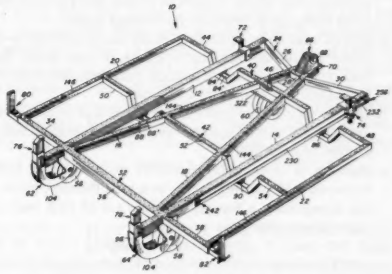
METHOD OF HANDLING LOOSE GLASS PLATES

Boyd S. Dawson, Cumberland, Md., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 289,205, Sept. 14, 1972, Pat. No. 3,838,779. This application Jan. 18, 1974, Ser. No. 434,480

Int. Cl. B65g *57/28*

U.S. Cl. 214—152 8 Claims



4. A method for handling loose glass plates, comprising:

locating a portable transporter having a receiving surface adjacent a glass plate producing line with the receiving surface in its loading position;

sequentially removing individual glass plates from the glass plate producing line;

positioning the individual glass plates onto the receiving surface to provide a glass pack;

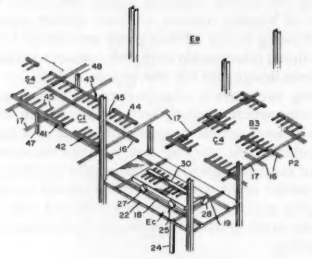
engaging the glass pack by securing means mounted on the transporter (1) to prevent longitudinal and lateral movement of the individual glass plates relative to the receiving surface and (2) to prevent movement of the glass plates away from the receiving surface when the transporter is being positioned in its unload position; and

moving the transporter to a glass storage area.

3,896,955
AUTOMATED MULTI-LEVEL VEHICLE PARKING SYSTEM

Earl R. Collins, La Canada, and Marshall E. Alper, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Oct. 3, 1974, Ser. No. 403,154
Int. Cl. E04h *6/06*
U.S. Cl. 214—16.1 CB **5 Claims**



1. A multi-level garage for parking automobiles or the like comprising:

a multi-level structure including a plurality of parking levels, each level defining a plurality of adjacent rectangularly shaped parking stalls, the length of each stall extending along a longitudinal axis and the width along a transverse axis with all the stalls' longitudinal axes being parallel to one another and their transverse axes being parallel to one another, each stall comprising four spaced apart units in the shape of multifinger combs with all the fingers of each stall being parallel to one another in a horizontal plane with fingers of opposite combs pointing toward one another with all the fingers of all the stalls at each parking level being in a common horizontal plane;

a grid of stall rails extending along each parking level at a plane below the horizontal plane of said stalls' fingers, with at least one pair of spaced apart parallel rails extending below the combs of each stall;

potential means for applying an electrical potential difference to the pair of spaced apart rails extending below the combs of each stall;

a plurality of rectangular elevators each movable vertically between said parking levels in a well thereof, each elevator comprising a top plate and a set of first and second pairs of elevator rails thereon;

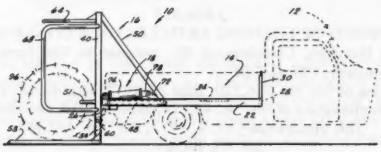
said two pairs of elevator rails including a pair of spaced apart elevator rails which extend along the elevator longitudinal axis and defining elevator longitudinal rails and a pair of spaced apart elevator rails which extend along the elevator transverse axis, and which define elevator transverse rails, whereby when an elevator is at a parking level its longitudinal rails are aligned and in contact with rails which extend along the longitudinal axes of the two stalls at opposite ends of the elevator, and the elevator's transverse rails are aligned and in contact with rails extending across stalls on opposite sides of the elevator along the stalls' transverse axes with the elevator rails being at the potentials of the stall rails with which they are in contact only when the elevator is at one of said parking levels; and

a movable transfer cart supported on the elevator's rails and including first energizable means in engagement with said rails and in electrical contact therewith and responsive to the potential difference between said rails for moving said cart between the elevator and any stall along the rails aligned with the elevator's rails, said transfer cart including a top horizontal transfer plate defining four multifinger combs at the ends thereof, the fingers of each comb being adapted to support a wheel of an automobile supportable on said cart, the fingers of the combs of the transfer plate being parallel to one another pointing outwardly and in a common horizontal plane, said cart further including second energizable means for raising said transfer plate to a first position above the horizontal plane of the stalls' fingers and for lowering said plate to a second position below the horizontal plane of the stalls' fingers, with said transfer cart being movable to any stall with the transfer plate in either of said positions, with the fingers of the transfer plate and each stall being aligned whereby when a transfer cart is at any stall the fingers of the transfer plate and those of the stall intermesh freely to enable the transfer plate to be moved between said first and second positions.

3,896,956
ROUND BALE LOADER FOR PICKUP TRUCK

Dewey L. Hostetler, R.R. 2, Box 4, Harper, Kans. 67058

Filed Dec. 12, 1973, Ser. No. 426,645
Int. Cl. B60p *1/16*
U.S. Cl. 214—501 **8 Claims**



1. A cylindrical bale loader for a truck or the like, comprising:

a. a frame means pivotally mountable on the bed portion of a truck or the like, said frame means having mounting means constructed and adapted to pivot said frame means when mounted on said bed portion from a generally vertical position at the rear portion of said bed portion to a generally forwardly tilted position overlying said bed portion,

b. said frame means in one end portion having a fork portion extending therefrom, said fork portion being constructed and adapted to receive a cylindrical bale in lifting position with a portion of said fork portion underneath said bale,

c. said loader has means connectable with said mounting means and said truck or the like to pivot said frame means,

d. said means to pivot said frame means being a power means mounted on said bed portion and,

e. the opposite end portion of said frame means having a bale retaining portion constructed and adapted to guide, hold and retain a cylindrical bale thereon as said bale rolls by gravity forwardly on said frame means when said frame means is moved from said vertical position to said forwardly tilted position or vice versa,

said loader when said frame means is mounted on said bed portion of said truck is constructed and adapted to receive a cylindrical bale, lift same when said frame means is pivoted, and retain same on said frame means when said frame means is in said forwardly tilted position overlying said bed portion of said truck.

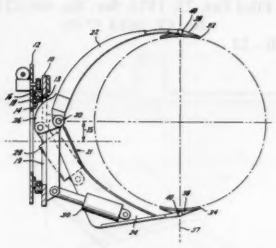
3,896,957
ROLL CLAMP

Stuart Wallace Sinclair, Houston, Tex., assignor to Anderson, Clayton & Co., Houston, Tex.

Filed May 8, 1974, Ser. No. 468,021
Int. Cl.[2] B66C *1/42*
U.S. Cl. 214—652 **5 Claims**

1. An apparatus for use on a lift truck elevator, which is attached to a truck or other suitable means of transportation, to lift and manipulate a cylindrical load comprising:

a. a rotating frame,
b. a first clamp arm,
c. a second clamp arm,
d. a pin for attaching the clamp arms to the rotating frame and about which the clamp arms are rotatable, where the pin is located adjacent to, and less than the diameter of one cylindrical load from, the rotating frame and is offset from the centerline of rotation of the rotating frame,



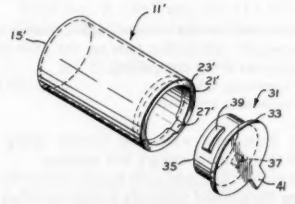
e. a first piston and cylinder assembly connected between the clamp arms for rotating the clamp arms with respect to each other about the pin, and
f. a second piston and cylinder assembly connected to the rotating frame and one of the clamp arms for simultaneous rotation of the clamp arms about the pin.

3,896,958

SAFETY VIAL AND CAP THEREFOR

Douglas R. Robbins, 37 W. Minster, and Samuel B. Robbins, Jr., 19 Beechview, both of Jamestown, N.Y. 14701

Continuation-in-part of Ser. No. 413,922, Nov. 8, 1973, Pat. No. 3,845,874. This application Feb. 1, 1974, Ser. No. 438,778
Int. Cl.[2] B65D *55/02*
U.S. Cl. 215—211 **3 Claims**



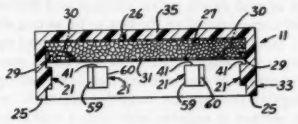
1. A safety vial and cap therefor, comprising in combination:
a hollow container having generally uniform wall thickness, the top of said container being open and including an inner depending rim shaped portion of a given depth around the inner diameter thereof, said inner depending rim shaped portion having a slot therein;
a plug type cap comprising an upper portion having a diameter approximately equal to the outer diameter of said container and a lower portion depending from said top portion and having an outer diameter approximately equal to the inner diameter of the inner depending rim shaped portion of said container, further including a first protuberance on the outside of the lower portion of said plug type cap, said first protuberance having a dimension equal to or less than the dimension of the slot in said inner depending rim shaped portion of said container, and a second protuberance on the lower portion of said plug type cap, oppositely disposed with respect to said first protuberance and having a dimension greater than the dimension of the slot in said inner depending rim shaped portion of said container.

3,896,959

CHILD SAFETY CLOSURE

Gerald L. Roy, Lancaster, Pa., assignor to Kerr Glass Manufacturing Corporation, Los Angeles, Calif.

Filed Dec. 3, 1973, Ser. No. 421,340
Int. Cl. B65d *55/02, 85/56;* **A61j** *1/00*
U.S. Cl. 215—222 **7 Claims**



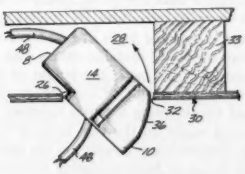
1. A combination comprising a container having a closed bottom wall and an upwardly extending wall terminating in an upper cylindrical end wall, a plurality of circumferentially spaced projections on said upper cylindrical end wall extending radially outwardly, each projection being formed with a downwardly opening notch and having surfaces defining said notches, a closure for securing to said container and closing the upper end of said container and to be child-resistant to opening, said closure including a one-piece plastic cap having a top wall and an integrally depending cylindrical skirt wall, a plurality of radially extending lugs on inner side of said depending skirt wall being spaced circumferentially about said skirt wall, said lugs having upper portions for fitting into said notches in said projections and for abutting said surfaces with attempted turning of said cap while in said notches, and a discrete foam disk means disposed between the inner side of said top wall of said cap and top portions of said lugs, said foamed disk means being resilient and being compressed between said container rim and said top end wall to within 50 to 80 percent of its uncompressed thickness, said foam disk means being free for further compression to shift said lugs axially downwardly from said notches with a compressive force of between 4 to 14 pounds to allow turning of said lugs to positions free of said notches for axially upward movement of the closure for removal from the container, said disk means comprising a flat foam disk body having an outer impermeable non-cellular skin layer for engaging the said upper cylindrical end wall and an integral closed cell foam layer for compression and resilience and having a low compression set.

3,896,960

ELECTRICAL JUNCTION BOX FOR EXISTING WALL CONSTRUCTIONS

Edgar C. Schindler, Seattle, and John C. McEachron, Tacoma, both of Wash., assignors to Nelco Corporation, Orting, Wash.

Filed Aug. 23, 1971, Ser. No. 174,065
Int. Cl. H02g *3/08*
U.S. Cl. 220—3.5 **21 Claims**



1. A wall-mounting electrical outlet box which can be inserted for mounting through an opening in the front panel of a wall that has a rear panel spaced from the front panel, where

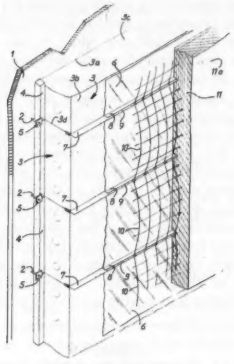
the width of the opening and the wall panel spacing are materially less than the width of the box, said box comprising a back, enclosing sides joined to and projecting forwardly from said back, and a front which includes a closed area portion adjacent to one side and an adjoining open area portion affording frontal access to the interior of said box located between the opposite side and said closed area portion, said opposite side converging inwardly toward the first side over substantially a major portion of the depth of the box to join the back, such inward convergence reducing the width of the box at the back by an amount of the same order of magnitude as the extent of said depth major portion and forming a chamfered relief corner enabling the box to be swung about an axis at the box front intermediate said one side and opposite side for clearing a side edge of the front wall panel opening during sidewise insertion of the box through said wall opening, and means adapting the box for mounting the same with its front open area portion in registry with such a wall opening and its closed area portion offset laterally from such wall opening behind the front panel.

3,896,961

INSULATED STORAGE TANK FOR LIQUID OR LIQUEFIED PRODUCTS

Jacques Guilhem, and Michel Bourgeois, both of Le Havre, France, assignors to Gaz Transport, Paris, France

Filed Apr. 5, 1973, Ser. No. 348,152
Claims priority, application France, Apr. 5, 1972, 72.11927
Int. Cl.[2] B65D *87/24;* **B63B** *3/68, 25/08*
U.S. Cl. 220—9 LG **1 Claim**



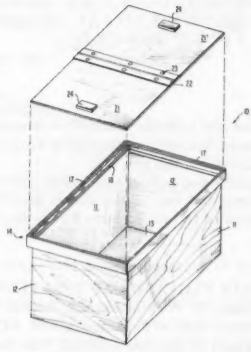
1. A leakproof and isothermal tank for the storage or the transportation of a liquid or of a liquefied product, said tank comprising two assemblies of leakproof and thermal insulation barriers, in succession, including a primary assembly in contact with the product contained in the tank, and a secondary assembly located between the primary barrier and the tank carrying structure, the secondary assembly comprising boxes filled with a heat-insulating material and held directly against said carrying structure by means of threaded pins which are fastened to the walls of said structure and a secondary leakproof barrier of metallic sheets with edges projecting toward the inside of the tank, the height of which is approximately equal to the height of said boxes of heat-insulating material, said sheets being secured together edge to edge at their projecting edges on the two faces of a metallic flange, said metallic flanges being inserted in the planes of horizontal joints of said boxes of heat-insulating material and extending toward the inside of the tank, and a metallic grid hooked on said metallic flanges, said grid being entirely contained within the thickness of a layer of plastic foam which has a low thermal contraction or expansion coefficient within the range of the temperature of use, said layer being inserted between the product contained in the tank and said secondary leakproof barrier.

3,896,962

PORTABLE FILE BOX WITH FILE SUSPENSION AND CARRYING MEANS

Lee M. Smith, Memphis, Tenn., assignor to Trav-L-File, Inc., Memphis, Tenn.

Filed Oct. 23, 1973, Ser. No. 408,421
Int. Cl. B65d *57/00*
U.S. Cl. 220—22 **4 Claims**



1. A portable file box for suspending file folders of the type having downwardly projecting tabs on the ends of laterally projecting support arms, comprising:

a pair of opposing side walls;

a pair of opposing end walls;

a bottom;

said side walls, end walls and bottom being integrally formed to provide a unitary box interior;

the upper ends of said side walls having outwardly extending gripping flanges and vertically extending offset continuations of the walls projecting upwardly from the outer edge of the flanges, said flanges and vertical continuations being integrally formed with said side walls;

a groove on the inside upper surface of each of said flanges formed by the inner surface of the respective vertical offset continuation of the side wall and an inner vertically extending projection of the side all, the inner surface of which projection is substantially flush with the inner surface of said side wall, said projection having less vertical extension from said upper surface of said flange than said offset continuation so as to provide clearance between the tops of said file folders being suspended within said box and the upper edges of said side and end walls, and said groove providing a track for said downwardly extending tabs of said lateral support arms of said file folders;

a shoulder integrally formed on the inside surface of the upper edges of said vertical offset continuations of said side walls for supporting a cover;

pivotable cover means for said file box and receivable on said shoulder for covering the interior of said box; and

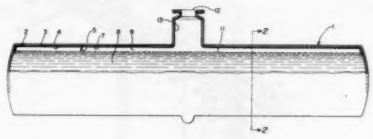
handle means for raising said cover.

3,896,963

LININGS FOR CONTAINERS FOR HANDLING CORROSIVE CHEMICALS AND THE METHOD OF PREPARING SAID CONTAINERS

Robert C. Schisler, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 21, 1973, Ser. No. 362,607
Int. Cl. B65d 25/14
U.S. Cl. 220—63 R 20 Claims



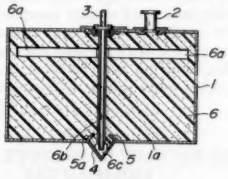
1. In a container suitable for the handling of corrosive fluids including an outer rigid shell having a flexible corrosion-resistant lining attached to the inwardly facing surface thereof, a protective cover of rubbery polymeric material attached only to that portion of the inwardly facing surface of the lining which confronts the corrosive substances in the vapor zone of the container with the remainder of the lining being free of said cover, said cover comprising a rubbery face layer disposed inwardly of the container, said face layer having resistance to cracking caused by the corrosive substances in the vapor zone.

3,896,964

SAFETY FUEL TANK HAVING HIGH SUCTION ABILITY

Atsuo Takei, Fujisawa; Isao Nagaoka, and Shozo Tsunoda, both of Yokohama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Nov. 7, 1973, Ser. No. 413,741
Claims priority, application Japan, Nov. 16, 1972, 47-131102
Int. Cl. B65d 25/14, 25/34
U.S. Cl. 220—88 R 2 Claims



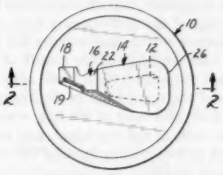
1. A safety fuel tank comprising, (a) a tank body, (b) a foamed body having open-cells disposed in said tank body; (c) a collector tank projecting downwardly from the bottom of the tank body, said collector tank extending across the width of tank body, and communicating with the interior of said tank body so as to allow fuel to collect in said collector tank, (d) a suction pipe extending vertically through said foamed body and terminating in said collector tank, and (e) a baffle plate secured to each joint between the tank body and collector tank, said baffle plates inclined upwardly and extending into said tank body and having passages therethrough for passing fuel along the bottom of the tank body into said collector tank.

3,896,965

TAMPER INDICATOR TAPE

Lew Wallace Cornell, Mound, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 17, 1973, Ser. No. 397,797
Int. Cl. G09f 3/03
U.S. Cl. 220—359 7 Claims



1. In a hermetically sealed container which encloses pourable material within a rigid wall having a preformed aperture therein, said aperture being covered and said container being hermetically sealed by a closure comprising a sheet material removably adhered directly to the portion of said wall which surrounds said aperture, said closure having a free end not attached to said wall, said closure being capable of being grasped by said free end and pulled back on itself without rupture to expose the underlying aperture and permit removal of the pourable material, the improvement which comprises: on the outer surface of said closure an indicator layer comprising a strong, flexible binder matrix having a Young's modulus at 2% elongation of at least about 125,000 pounds per square inch containing, dispersed throughout, a solid color-forming substance and capsules containing a liquid dye precursor reactable with said color-forming substance, at least a portion of said indicator layer being intermediate said free end and the nearer edge of said aperture,

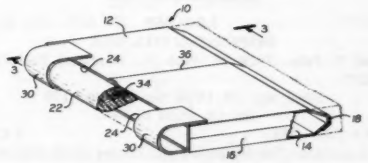
whereby, when said closure is flexed by force applied to said free end, said capsules rupture and the color-forming substance and dye precursor react to form a colored dye indicating that said can closure has been at least partially removed.

3,896,966

BAG DISPENSING PACKAGE

Leonard E. Canno, New York, N.Y., assignor to Equitable Bag Co., Inc., Long Island City, N.Y.

Filed Dec. 10, 1973, Ser. No. 423,570
Int. Cl. B65h 1/04
U.S. Cl. 221—63 3 Claims



1. A bag dispensing package including a stiff panel, a bag assembly comprising a plurality of bags folded around a front edge of the panel along their mid-regions, and folded only at their mid-regions, whereby the bags beyond said mid-regions are substantially parallel to one another, a container having top, bottom and side walls, and a rear wall surrounding the bag assembly on all sides of the respective sides thereof except the front of said bag assembly, the front of the container having a front wall open for an area that exposes the folded end of the bag assembly across the center of the front of the assembly and for a part of the front of the assembly beyond the center

thereof, and the front of the container being also open for a limited distance extending rearwardly from the exposed foremost end of the folded assembly far enough to permit an operator to grip the mid-region of the outside bag of the assembly adjacent to the back end of the fold of said assembly to pull the most forward bag of the assembly from the container as a single unit, the container having its front closed across a part of the bag assembly for a distance inward from the sides of the container, and characterized by the container being a paper bag of the self-opening type with side gussets and with the bottom of the bag forming the back wall of the container, and with the edges of the mouth of the bag substantially equidistant from the back wall and constituting the rearward limits of the open front of the container, and straps secured to the front and back of the bag, which constitute the top and bottom walls of the container, and adjacent the front of the container and extending beyond the mouth of the bag to form abutments that hold the bag assembly in the container.

3,896,967

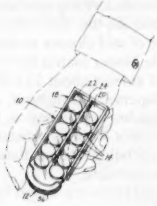
ARTICLE HANDLING APPARATUS AND METHOD

John J. Doolittle, 209 N. 29th St. West, Bradenton, Fla. 33505

Filed Feb. 12, 1973, Ser. No. 331,516

Int. Cl. B65h *3/44*

U.S. Cl. 221—95 **9 Claims**



1. Article handling apparatus comprising, first means including a supply area for articles, a receiver having first and second receiving locations, one for receiving each of two of said articles from the supply area, means mounting said receiver for movement between a first position for receiving one of said articles from the supply area and a second position, and yieldable means on said receiver between said receiving locations for moving another of said articles in said supply area and adjacent said receiver, in a direction generally away from the receiver responsive to the receiver moving toward at least one of said positions.

3,896,968

DISPENSING PILL BOX

Harold T. Pehr, 3920 W. 96th St., Overland Park, Kans. 66207

Filed Apr. 29, 1974, Ser. No. 465,179

Int. Cl. B65d *83/04*

U.S. Cl. 221—288 **5 Claims**

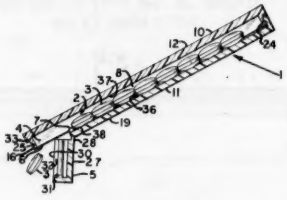
1. A container for dispensing and storing small objects such as pills and the like comprising:

a. an elongate bottom portion having a flat bottom wall and an upstanding continuous peripheral wall of uniform height, said peripheral wall having parallel side portions;

b. an elongate cover portion having a flat top wall and a depending peripheral wall;

c. cooperating interengaging means on the upstanding and depending peripheral walls removably securing the cover portion onto the bottom portion, said walls defining an elongate chamber adapted to store a plurality of objects therein with said objects being sized to be movable longitudinally but substantially immovable laterally in said chamber;

d. said cover portion top wall having a transverse hinge and the depending wall having separations in line therewith providing a hingedly connected closure portion at one end of the container, said closure portion being swingable away from the bottom portion to an open position providing a dispensing opening between the hinge and the adjacent end of a size for passage of one object therethrough when the container is in an inverted position;



e. lug means on said cover portion adjacent said hinge forming a shoulder facing away from the dispensing opening and having a spacing from said bottom wall to permit passage of objects therebetween when the container is in normal position and to engage a proximate one of said objects when the container is in inverted position for dispensing one of said objects at the dispensing opening and returning the remaining objects in the chamber between said shoulder and the end remote from said dispensing opening.

3,896,969

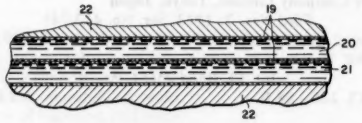
WATER SEALING CONSTRUCTION

Mario J. Basile, 8512 Fifth Ave., Brooklyn, N.Y. 11209

Filed May 2, 1973, Ser. No. 356,338

Int. Cl. B32b *3/12*

U.S. Cl. 222—54 **2 Claims**



1. A water barrier structure comprising solid matrix having embedded therein a fluid sealant composition enclosed in a water soluble envelope, said sealant composition comprising a liquid resin curable to a solid state enclosed in water soluble microcapsules, defining said envelope and a curing agent enclosed in other water soluble microcapsules.

3,896,970

AEROSOL PACKAGE OF PRODUCT CONTAINING LIQUIFIED GAS

Robert H. Laauwe, Franklin Lakes, N.J.

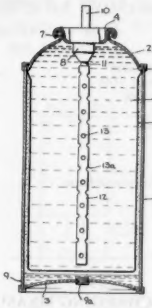
Division of Ser. No. 270,560, July 10, 1972, Pat. No. 3,788,521. This application Oct. 26, 1973, Ser. No. 409,689

Int. Cl.[2] B65D *35/24*

U.S. Cl. 222—94 **8 Claims**

1. An aerosol package comprising a substantially rigid container having a dispensing valve, a collapsible flexible container inside of said rigid container and internally fluid connected to said valve and containing an extrudable product in which liquified compressed gas is intimately dispersed or dissolved, said product being adapted to be dispensed through said valve, and liquified compressed gas propellant between said containers and applying fluid pressure to said flexible container and which is transmitted therethrough to said product to extrude said product upon operation of said valve, said

propellant having a vapor pressure substantially greater than the vapor pressure of said gas in said product while intimately dispersed or dissolved therein, said liquified gas in said product normally tending to form gas bubbles interfering with a uniform extrusion of said product and the vapor pressure of said propellant being great enough to apply enough compression to said product through said flexible container to prevent



formation of said bubbles, said package including a flexible tube by which said flexible container is connected to said valve, said tube extending from said valve a substantial distance within said flexible container and said tube having a lengthwise series of openings in its wall, said flexible container collapsing as said product is extruded therefrom and said openings preventing blockage of said tube by said collapsing container.

3,896,971

COLOR DISPENSER FOR USE WITH PRESSURIZED CANS OF WHIPPED TOPPING

William Schwede, 40 Woodmar Ter., West Seneca, N.Y. 14224

Filed May 30, 1974, Ser. No. 474,720
Int. Cl. B65d *37/00*
U.S. Cl. 222—106 **3 Claims**

1. A color dispenser designed to be filled with food coloring and adapted for use with a presurized can of whipped topping having a slitted discharge nozzle, said dispenser comprising:

a hollow ring having a chamber, the inner circumference of the ring defining the periphery of an opening through which the nozzle of the can can extend, said ring having a plurality of nozzles disposed symmetrically about said inner circumference and connecting said chamber to said opening;

a flexible hollow pouch having a chamber and contiguous to said ring, the ring and pouch chambers communicating with each other; and

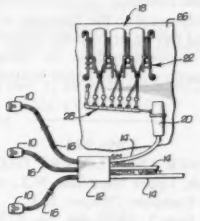
a retaining loop detachably secured to and pressing against said ring nozzles, said loop being disposed in said opening.

3,896,972

REMOTE LIQUID DISTRIBUTION SYSTEM

Samuel W. Neidore, 4615 Rubio Dr., Encino, Calif. 91316, and Howard K. Arnold, 221 Ruth Ave., Venice, Calif. 90291

Filed July 9, 1973, Ser. No. 377,219
Int. Cl. B67d *5/60*
U.S. Cl. 222—136 **5 Claims**



1. In a remote liquor distribution system for supplying a bar dispenser mechanism from a plurality of individual liquor bottles:

a. a fluid motor for supplying liquor under pressure to a conduit cooperable with a dispenser mechanism;

b. said fluid motor having an inlet;

c. a vented manifold having a feeder channel and a series of upwardly extending inlet ducts each communicating with the feeder channel;

d. means connecting the feeder channel to the motor inlet;

e. means separate from the manifold for supporting a plurality of liquor bottles in an inverted position; and

f. a plurality of flexible conduits for connecting the inlet ducts to the bottles with the bottles in spaced relationship thereto, each conduit being detachably connected both to the bottle and the inlet duct;

g. said supporting means relieving said conduits from the entire weight load of said bottles;

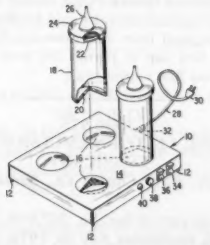
h. each flexible conduit being telescopically received in the corresponding inlet duct, each conduit carrying a stop engageable with the end of the inlet duct to determine the vertical position of the end of the flexible conduit in the manifold correspondingly to determine the order in which the bottles are placed on-line relative to said feeder channel.

3,896,973

HEATED DISPENSING APPARATUS

Fred Morgan, 1 Forest Rd., Glen Burnie, Md. 21061

Filed Apr. 8, 1974, Ser. No. 458,892
Int. Cl.[2] F27D *11/00*
U.S. Cl. 222—146 HE **14 Claims**



1. Heated dispensing apparatus comprising

a base member having a substantially planar upper surface;

a plurality of protrusions formed as an integral part of said surface and extending above the plane thereof, each

of said protrusions defining a generally horizontal, unbroken, aplanar support surface having a circular periphery; means inbedded in said base member and disposed directly below said protrusions for exclusively heating the same over substantially the entire exposed surface area thereof; and

at least one unitary, resilient, cylindrical container removably disposed directly atop said base member for heating fluid within said container, said container having a diameter substantially equal to the diameter of said at least one protrusion and having ar recessed bottom conforming to said aplanar support surface for direct heat transfer contact therewith over the entire bottom surface of said container.

3,896,974

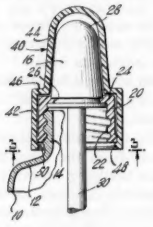
CONTAINER AND CLOSURE THEREFOR

James A. McIntosh, Upper Montclair, N.J., assignor to Mack-Wayne Plastics Company, Wayne, N.J.

Filed June 7, 1974, Ser. No. 477,228

Int. Cl. B65d *83/14*

U.S. Cl. 222—182 **11 Claims**



1. A container and closure combination comprising a container with a threaded neck, a first cap having a correspondingly threaded skirt engaged on said neck to close the container and an overcap having a resilient skirt covering said first cap and preventing removal of said first cap without first removing said overcap, said resilient skirt having an internal latching surface disposed at a first circumferential location thereon and engaging the downwardly facing latching surface of said first cap to prevent the axial removal of said overcap from said first cap without first disengaging said latching surfaces, said overcap being dimensioned to be axially removable from said first cap without relative rotation therebetween upon disengaging said latching surfaces to expose the first cap for removal of the first cap from the container, an outer surface of said first cap and an inner surface of said overcap defining a clearance therebetween in a circumferential region spaced from said internal latching surface of said overcap to accommodate flexing of said cap into said clearance which results in the outward flexure of the skirt in the region of said latching surface thereof whereby said latching surface of the overcap is disengaged from said downwardly facing latching surface of said first cap to permit the axial removal of said overcap from said first cap.

3,896,975

NON FOAMING LECITHIN EMULSION COOKWARE LUBRICANT

Dan W. Follmer, 5230 Coruna Ct., Santa Barbara, Calif. 93111

Continuation-in-part of Ser. No. 267,070, June 28, 1972, abandoned. This application July 26, 1974, Ser. No. 492,258

Int. Cl.[2] C08L *91/00;* **C09K** *3/30;* **B65D** *83/14*

U.S. Cl. 222—192 **22 Claims**

1. Cookware lubricant composition adapted to be dispensed under aerosol propellant pressure from a suitable container onto a cookware surface without foaming while temporarily marking the surface coverage, said composition comprising an aqueous component having a pH between 3 and 9.8 and comprising a water in oil emulsion of 0.5 to 25% by weight of lecithin consisting essentially of P-inositol, P-choline and P-cephalin phosphatides in a ratio such that said composition has an HLB number of not more than 7, said P-inositol comprising not less than 10% of the total weight of said phosphatides.

18. Cookware lubricant aerosol package comprising a pressure resistant container having a dispensing valve, and disposed therein:

	% by Weight
A) Lecithin phosphatides comprising at least 10% by weight P-inositol	4
B) Soybean Oil	3
C) Aliphatic Solvent	7
D) Water	50
E) Propellant	
(1) Isobutane	9
(2) Difluorodichloromethane	26
F) Glyceryl palmitate	1

to 100 percent.

3,896,976

DEVICES FOR DISCHARGING MEASURED AMOUNTS OF A FLUID MATERIAL

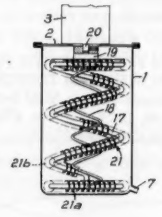
Pierre Ligouzat, 49, rue des Tartres, 92 Rueil, France

Continuation-in-part of Ser. No. 299,467, Oct. 20, 1972, abandoned. This application Apr. 18, 1974, Ser. No. 461,845

Claims priority, application France, Oct. 26, 1971, 71.38484

Int. Cl.[2] G01F *11/00*

U.S. Cl. 222—228 **3 Claims**



3. A device for discharging measured amounts of a fluid material comprising:

a container having a bottom wall, having a cylindrical, inner side wall portion adjacent the bottom wall thereof and having at least one discharge orifice through said portion, said cylindrical wall portion having an axis extending transversely to said bottom wall;

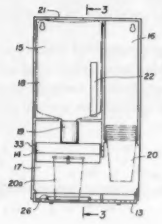
motor means mounted on said container at the upper end thereof and having a rotatable output shaft substantially co-axial with said axis;

at least one helically wound element having a predetermined winding axis; and

means mounting said helical element from said shaft with the winding axis thereof extending at least once around and spaced from said axis of said cylindrical portion, with the outer periphery of said helical element immediately adjacent said wall portion and said orifice and with the winding axis thereof in a plane substantially perpendicular to the axis of said cylindrical portion whereby upon rotation of said shaft said helical element is moved around said axis of said portion in a circular path adjacent to said discharge orifice and said wall portion to thereby discharge said material through said orifice, said mounting means comprising a spring wound helically around said axis of said cylindrical portion and secured to said output shaft, said spring having an annular portion adja-

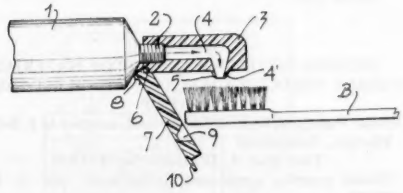
cent said bottom wall, said helical element having an annular portion around said annular portion of said spring and having another portion around the helical portion of said spring.

3,896,977
LIQUID DISPENSER
Thomas G. Bergstrom, 1312 Appeal Ave., Elmont, N.Y. 11003
Continuation-in-part of Ser. No. 243,691, April 13, 1972, abandoned. This application Apr. 2, 1973, Ser. No. 346,967
Int. Cl. G01f *11/10*
U.S. Cl. 222—353 **15 Claims**



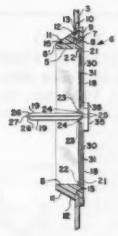
1. A dispenser for extracting predetermined amounts of liquid from a substantially air-tight container, comprising an independent trough mounted below said container for tilting about a horizontal axis, said trough normally residing at a predetermined angle; conduit means adapted to communicate with the inside of said container below the liquid level and having an open end extending into said trough; a walled area within said trough surrounding the region into which said conduit means extends having a liquid access to the remainder of said trough below the trough walls, the level of liquid retained in said walled area at all times being sufficient to make contact with said conduit means; and a dispensing aperture outside of said region located above the lowermost internal portion of said trough when it resides at said predetermined angle.

3,896,978
CLOSURE FOR COLLAPSIBLE TUBES
Raphael Sahar, No. 3 Palmach St., Tiberias, Israel
No Drawing. Filed July 23, 1973, Ser. No. 381,608
Int. Cl.² B67D *3/00*
U.S. Cl. 222—517 **4 Claims**



1. A closure for collapsible tubes consisting of:
an elongated body having a flat side and first and second ends and a main portion therebetween, said body having a bore extending therethrough, said bore having internal screw threads at the end thereof corresponding to said first end of said body, the opposite end of said bore being bent off the direction of the main portion of said bore and opening into said flat side;
a lid hingedly attached at one end thereof to said body at said first end thereof, said lid closing to cover only said flat side, and sealing the opening of said bore in said flat side, the only surface of said lid contacting said body being a flat surface corresponding to said flat side of said body;
spring means for urging said lid into the shut position; and
a nose extending from the other end of said lid to beyond said second end of said body.

3,896,979
DISPENSING SPOUT
Harold T. Pehr, 3920 W. 96th St., Overland Park, Kans. 66207
Filed Oct. 1, 1973, Ser. No. 402,114
Int. Cl. B67d *3/00*
U.S. Cl. 222—528 **7 Claims**

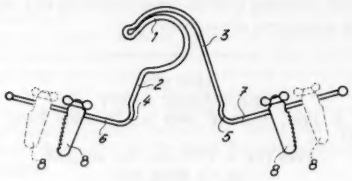


1. A dispensing container comprising:
a. a container body having side, top and bottom walls defining a compartment for flowable materials;
b. means in one of said body walls having edges defining a dispensing opening, said edges including side edges and a top edge;
c. a dispensing spout carried by said one of said body walls and having operable portions movable relative to said dispensing opening between container closing and material dispensing positions;
d. said dispensing spout having a plurality of hingedly connected panels and including a pair of intermediate panels and a pair of side panels, said side panels having inner and outer side edges with said outer edges hingedly and sealingly connected to said side edges of the dispensing opening for the length thereof, said intermediate panels having adjacent edges directly hingedly and sealingly connected to each other along the length thereof and opposite edges hingedly and sealingly connected to the inner side edges of the side panels along the length thereof;
e. said dispensing spout being foldable to a position wherein the side panels close the dispensing opening and the intermediate panels each fold flat against the other and extend inwardly through the dispensing opening.

3,896,980
DEVICE FOR HANGING CLOTHES, SUCH AS TROUSERS OR SKIRTS
Tullio Campagnolo, 36100 Vicenza, Corso Padova; 168, Italy
Filed July 17, 1973, Ser. No. 380,055
Claims priority, application Italy, July 31, 1972, 27682/72
Int. Cl. A47j *51/12*
U.S. Cl. 223—95 **3 Claims**

1. A device for hanging clothes comprising a hanging deformable wire structure defining two slanting branches diverging downwardly and extending into two arms pointing in opposite directions which lie in the same plane and gripping means slidably mounted and lockable on each of said arms, each said gripping means comprising an element outwardly notched, a head attached to said element having a transverse through

hole for receiving one of said arms and a longitudinal threaded dead hole, an outwardly threaded pin fitting within said dead



hole having a transverse hole for receiving one of said arms and a winged nut threadably mounted on said threaded pin.

3,896,981

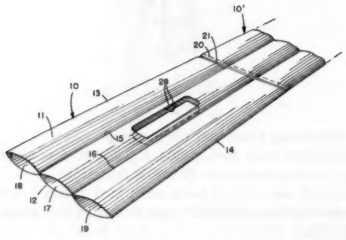
PROTECTIVE SKI TRANSPORT BAG

Edward B. Purple, 147th St.-Forest Hills, Lockport, Ill. 61603

Filed Feb. 14, 1974, Ser. No. 442,668

Int. Cl. B65d *71/00*

U.S. Cl. 224—45 S **7 Claims**



1. A protective ski transport bag formed of thin foldable sheet material selected from the group consisting of plastic film and paper, said bag having a pair of flat elongated walls joined together along their longitudinal side edges and also sealed together along a pair of longitudinal inner lines, said inner lines being spaced apart to define a central pocket open at one end of the bag for receiving a pair of ski poles, said inner lines also being spaced from the longitudinal side edges of said bag to define a pair of side pockets open at said one end of said bag for receiving a pair of skis, each side pocket being adapted to receive a single ski, said side pockets being substantially longer than the skis receivable therein and all of said pockets being substantially equal in length, said bag and its contents having handle means formed by manually gripping intermediate portions of the poles to hold said poles together within said central pocket and thereby form a sling for suspending the side pockets and the skis therein in balanced condition, said walls being permanently joined together to close said pockets at the end of said bag opposite from said one end.

3,896,982

WIRE SOLDER FEEDER

Glen R. Redman, 1303 Maple Dr., Alamogordo, N. Mex. 88310

Filed Mar. 28, 1974, Ser. No. 455,767

Int. Cl. B65h *17/36*

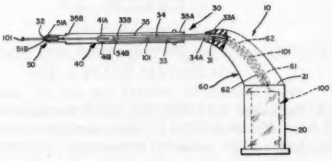
U.S. Cl. 226—128 **5 Claims**

1. A wire feeder assembly, adapted for feeding coiled wire-type solder to a work area, comprising:

a. a transparent container, for housing a supply of coiled wire-type solder, having an outlet for permitting the free passage of the wire-type solder therefrom;

b. a holding, guiding, and dispensing subassembly having a first end and a second end, with said first end of said subassembly being removably connected to said outlet of said container, wherein said subassembly is adapted to receive the wire-type solder and to permit the free passage of the wire-type solder therethrough, and wherein said subassembly includes:

1. a stationary hollow metallic tube having a first end and a second end;
2. a hollow tube liner of non-abrasive material, having a first and a second end, and disposed internal of, and adjacent to, said stationary hollow metallic tube;
3. a hollow metallic tube, having a first end and a second end, with said tube disposed external of, adjacent to, and slideably movable on, said stationary hollow metallic tube;
4. means for gripping said wire-type solder, and for pulling said solder wire from said container and through said stationary hollow metallic tube, and for preventing the return of said solder wire to said container, wherein



this said means is removably positioned at said second end of said stationary hollow metallic tube, and wherein this said means includes two oppositely disposed complementary jaws;

5. and, means for gripping said wire-type solder, and for pulling said solder wire through said movable hollow-metallic tube, and also for preventing the return of said solder wire to said stationary hollow metallic tube, and further for holding said solder wire ready for, and during, use, wherein this said means is removably positioned at said second end of said movable hollow metallic tube, and wherein this said means includes two oppositely disposed complementary jaws;

c. and, means for releasably connecting said holding, guiding, and dispensing subassembly to said container, wherein this said means is located intermediate of said holding, guiding, and dispensing means and of said outlet of said container, and wherein said releasably connecting means permits the free passage therethrough of said solder wire.

3,896,983

GUIDING SYSTEM FOR A STRIP OF MATERIAL PASSING THROUGH A MACHINE WHICH PROCESSES THE STRIP

Othmar Weinguni, Renens, Switzerland, assignor to J. Bobst & Fils S.A., Switzerland

Filed Mar. 4, 1974, Ser. No. 447,858

Claims priority, application Switzerland, Mar. 9, 1973, 3474/73

Int. Cl. B65h *23/32*

U.S. Cl. 226—198 **11 Claims**

1. A guiding system for a strip of flexible material passing through a machine which processes the strip and which includes a work station having a lower bed and an upper platen which carry tool holder plates between which the strip is processed and between which the strip may arch vertically, said guiding system comprising:

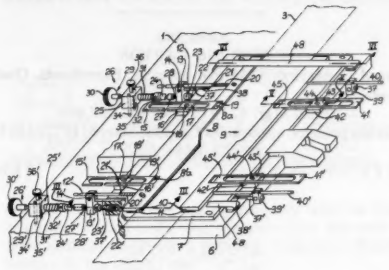
a first laterally adjustable guide between the tool holders;

a second laterally adjustable guide between the tool holders, spaced from and parallel to said first laterally adjustable guide,

said first and second guides receiving the strip therebetween and extending substantially the length of the platen in the direction of strip movement;

first support means mounting said first laterally adjustable guide in the space between the upper platen and the lower bed;

second support means mounting said second laterally adjustable guide in the space between the upper plate and the lower bed;



resilient means connected between one of said laterally adjustable guides and its respective support means to permit momentary lateral movement of that guide in response to width variations of the flexible strip;

a transverse guide at the input end of and spaced above the lower tool holder plate;

a second transverse guide at the output end of and spaced above the lower tool holder plate;

each of said transverse guides comprising a metal band secured at its ends under tension; and

said transverse guides limiting vertical distortion of the strip as it moves between the tool holders.

3,896,984

PNEUMATIC CONVEYANCE SYSTEM FOR PARTICULATE MATERIAL

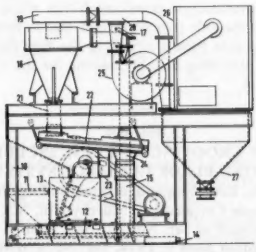
Albert Edwards, Peterborough, England, assignor to Baker Perkins Holding Limited, Peterborough, England

Filed Mar. 25, 1974, Ser. No. 454,707

Claims priority, application United Kingdom, Mar. 28, 1973, 14979/73

Int. Cl.[2] B02C *19/06*

U.S. Cl. 241—5 **7 Claims**



1. A method of treating particulate material, said method comprising

using suction means to receive and convey agglomerated particulate material,

breaking down, in a separator means, the particulate material conveyed from the suction means,

screening the particulate material after the latter has been broken down, and

returning the non-screen material to the suction means, said receiving and conveying step including disposing an internal surface member, having peaks and depressions formed thereon, within the suction means, in the path of flow of the particulate material, so that the particulate material is broken down and scrubbed by collision with the internal surface member during conveyance through said suction means.

3,896,985

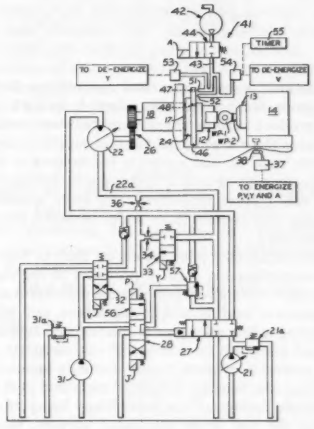
INDEXING APPARATUS FOR ROTARY MACHINE TOOL

Jozef Kiwalle, Peoria, Ill., assignor to Production Technology Inc., Peoria, Ill.

Filed Oct. 25, 1972, Ser. No. 300,482

Int. Cl.[2] B23K *27/00*

U.S. Cl. 228—2 **10 Claims**



1. In a rotary machine tool having a chuck which is rotatable by a variable speed hydraulic motor, indexing apparatus for locating the chuck in a selected angular position, comprising

a source of fluid under pressure,

hydraulic control means for regulating operation of the hydraulic motor and including means for communicating selectively variable hydraulic fluid pressure to the hydraulic motor,

first signal means to which the hydraulic control means is responsive for commencing operation of the hydraulic motor at a relatively high speed,

second signal means to which the hydraulic control means is responsive, the second signal means including means for sensing a first angular position of the chuck and thereupon causing the hydraulic control means to operate the hydraulic motor at a reduced speed,

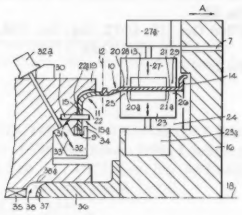
third signal means associated with the hydraulic control means and including means for sensing approach of the chuck towards its selected angular position, and

a valve included within the hydraulic control means and being responsive to the third signal means for closing a fluid outlet of the hydraulic motor and thereby braking the hydraulic motor to accurately stop the chuck in the selected angular position.

3,896,986
METHODS OF AND APPARATUS FOR PRODUCTION OF WHEELS AND OTHER ARTICLES BY FRICTION OR OTHER WELDING

Michael Frederick Edwards, Wolverhampton, England, assignor to GKN Sankey Limited, Bilston, Great Britain

Division of Ser. No. 218,899, Jan. 19, 1972, Pat. No. 3,805,371. This application Nov. 28, 1973, Ser. No. 419,598
Claims priority, application United Kingdom, Jan. 25, 1971, 3110/71; Jan. 26, 1971, 3111/71
Int. Cl. B23k *19/00*
U.S. Cl. 228—2 **8 Claims**



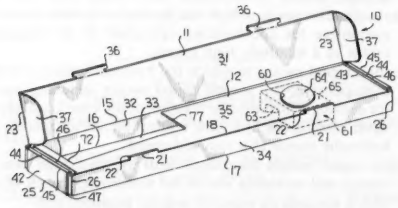
1. In frictional welding apparatus comprising a body, workpiece supports thereon movable relatively to each other in a mode to produce rubbing engagement between workpieces at contact faces thereof when held in said supports, means associated with each of said supports for holding a workpiece concentrically with an axis of said support, driving means for effecting said relative movement, and force applying means for engaging said contact faces under pressure, the improvement comprising:

mutually-engageable pilot means on each of said supports for controlling the relative positions of the supports at least after cessation of said relative movement and during operation of said force applying means, said pilot means including a first pilot part on one of said supports and a second pilot part on another of said supports, said first and second pilot parts having mutually opposed bearing surfaces, the bearing surface of each said part including a radially facing surface portion and being of a form to define the axis of its associated support, said bearing surfaces being brought into mutual contact during engagement of said pilot means, whereby coincidence of said axes is achieved.

3,896,987
GUN BOX

Joseph J. Soja, Portland, Conn., assignor to Continental Can Company, Inc., New York, N.Y.

Filed July 13, 1970, Ser. No. 54,254
Int. Cl. B65d *5/20, 85/00*
U.S. Cl. 229—33 **19 Claims**

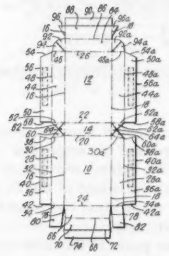


1. A carton blank particularly adapted for packaging articles such as rifles, shotguns, hand guns and the like, comprising a sheet material blank provided with a plurality of fold lines about which said blank is adapted to be folded into a generally tubular configuration, at least one of said plurality of fold lines in part sets off a locating panel, means defined by said locating panel for interlockingly engaging an insert profiled in accordance with the contour of at least a portion of an article adapted to be packaged in said blank whereby undesired relative movement of the blank and packaged article is precluded by the interlocking engagement provided by said interlocking means, and an insert having means for interlockingly engaging the interlocking means of said locating panel.

3,896,988
MAILING CARTON

Edward C. Mayled, 5245 Provence St., Pierrefonds, Quebec, Canada

Filed Mar. 5, 1973, Ser. No. 337,882
Claims priority, application Canada, Mar. 8, 1972, 136732
Int. Cl. B65d *3/22*
U.S. Cl. 229—33 **3 Claims**



1. A one piece blank for a hinge carton comprising a first rectangular panel and a second rectangular panel defined by a pair of common, parallel, longitudinal fold lines and connected by an intermediate panel defined by said longitudinal fold lines and by a pair of transverse fold lines, with said first and second panels, respectively; side panels adjoining each of the first and second panels along said longitudinal fold lines, the transverse fold line bordering the intermediate panel and the second panel projecting beyond the longitudinal fold line along the fold axis thereof and defining the end of the side panel adjoining the second panel; a gusset forming panel adjoining the intermediate panel and the ends of the side panels adjoining the first and second panels, a fold line defined between said gusset panel and the end of the side panel adjoining the first panel, said latter fold line being at an acute angle to the projection of the transverse fold line between the first panel and the intermediate panel, such that when the carton is made up with the side panels upright, the so-formed gusset panel forces the side panels adjoining the first panel to converge inwardly providing suitable nesting for the side walls of the second panel.

3,896,989
PAVEMENT GROOVING MACHINE INCLUDING A CUTTING BLADE GUIDANCE SYSTEM

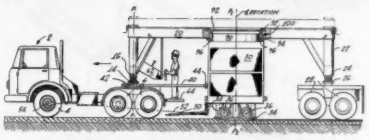
Stafford M. Ellis, Kent, England, assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Continuation-in-part of Ser. No. 261,360, June 9, 1972. This application June 5, 1974, Ser. No. 476,461
Int. Cl.[2] E01C *23/09*
U.S. Cl. 299—39 **22 Claims**

1. In a pavement grooving machine including a truck provided with steerable front wheels and at least one set of rear wheels located adjacent a horizontal rear transverse axis of the truck; a trailer connected to the truck for articulated motion about a vertical first pivot axis intersecting the rear transverse axis of the truck, the trailer having at least one set of rear wheels located adjacent a horizontal rear transverse axis of the

trailer spaced rearwardly from the rear transverse axis of the truck; and at least one assembly of spaced, rotary cutting blades mounted on a generally horizontal drive shaft; a blade guidance system operable during movement of the pavement grooving machine around a curve in the pavement to maintain the cutting blades in substantially parallel relation to the curve, the guidance system comprising:

a module mounted on the trailer for rotational motion about a vertical second pivot axis positioned between the rear wheels of the truck and the rear wheels of the trailer, said



module supporting the cutting assembly with the blades in cutting engagement with the pavement and with the drive shaft extending in a generally transverse direction relative to the trailer; and

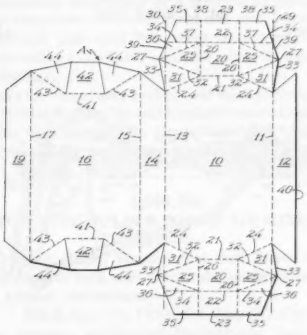
linkage means connecting the truck with said module for rotating said module relative to the trailer during relative turning motion between the trailer and the truck in such relation that the drive shaft and the rear transverse axes of the truck and the trailer are all substantially aligned with a common turning center.

3,896,990

BOOK FOLDER WITH CUSHIONING END

William G. Sieffert, Joliet, Ill., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Sept. 16, 1974, Ser. No. 506,522
Int. Cl.² B65D *5/02*
U.S. Cl. 229—40 **10 Claims**



1. A book folder end closure for a book folder having a bottom panel, a first side wall panel, a top panel, and a second side wall panel secured in tubular relation, the bottom panel having an extension flap end structure,

a rectangular end wall secured to the center portion of said bottom panel along a line of fold terminating short of the side edges of said bottom panel,

a substantially rectangular cushioning panel connected to said end wall along a fold line,

said rectangular end wall extending upwardly and inwardly from the end of said bottom panel at an acute angle thereto,

said cushioning panel extending downwardly into edge abutting contact with said bottom panel and at substantially right angles thereto,

said end wall cushioning panel, and bottom panel forming a hollow right triangular cushioning member,

isosceles triangles having their bases foldably connected to the sides of said end wall, the distance between the apexes of said isosceles triangles being greater than the width of said bottom panel so as to lie in vertical planes through the side walls and against said side walls,

fold lines extending angularly from the ends of said line of fold connecting said end wall to said bottom wall to the ends of the fold lines connecting said bottom panel to said side wall panels, said fold line connecting said bottom panel to said end walls being located beyond the ends of the fold lines connecting said bottom panel to said side walls,

triangular flaps between said angularly extending fold lines and one equal length side of said isosceles triangles whereby the one side of said isosceles triangles extend on substantially a vertical plane through the fold line connecting said bottom panel to said end wall,

extension fold lines aligned with said the fold line connecting said end wall to said cushioning flap extending across said said extension flap structure,

right triangular flaps between said extension fold lines and the other equal length sides of said isosceles triangles, said right triangular flaps extending parallel to said bottom panel and underlying said top panel, and

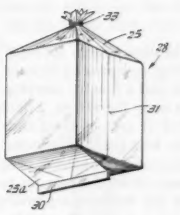
the portions of said extension flap structure beyond said extension fold lines and connected to said cushioning panel extending downwardly into edge contact with said bottom panel.

3,896,991

COMPOSITE FLEXIBLE, SEMI-RIGID MATERIALS AND PROCESS FOR MAKING SAME

Edward C. Kozlowski, 74 Columbine Dr., Trumbull, Conn. 06611, and Matthew D. Chamlin, 322-A Hailman St., Pittsburgh, Pa. 15206

Filed Feb. 28, 1973, Ser. No. 336,722
Int. Cl. B65d *33/01*
U.S. Cl. 229—55 **7 Claims**



1. A container formed from a laminate comprising a self-supporting strip of determinate length and width, a first relatively thin, flexible, inner plastic strip adhered to the inner surface of said support strip and a second thin, flexible, outer plastic strip adhered to the outer surface of said support strip, said first and second plastic strips being of the same length as the support strip at the opposed edges of the laminate but being substantially wider than said support strip and having continuous projecting marginal portions extending substantially beyond each surface of the support strip and being completely adhered together in face-to-face relation at the ends of the laminate, the opposed edges of the laminate being secured together by means of a unitary plastic-to-plastic seal to form a tubular container in which the rigid support sheet is completely enveloped and sealed between the inner and outer plastic strips, the projecting marginal portions of the plastic strips of the tubular container being continuous and sufficiently wide to be folded inwardly along the edges of the support strip at the ends of the laminate to form end closures

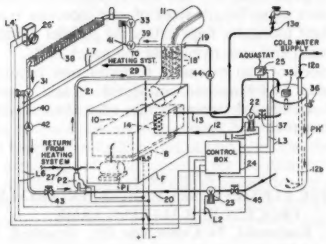
for the container whereby the encased rigid support strip constitutes the support of the container.

3,896,992

HEAT RECOVERY SYSTEM FOR SPACE HEATING AND FOR POTABLE WATER HEATING

Anton Borovina, 67 Columbia St., Port Jefferson Station, N.Y. 11152, and Henry E. Grattan, Conscience Cir., Setauket, N.Y. 11103

Filed July 18, 1974, Ser. No. 489,700
Int. Cl.[2] F24D *3/08;* **F24H** *1/22*
U.S. Cl. 237—19 **11 Claims**



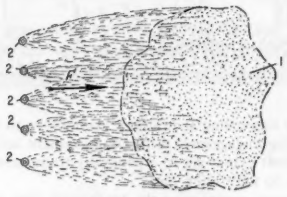
1. A hot water heating system for both space heating and potable water heating, comprises a furnace having heat generating means therein and a flue for carrying hot, gaseous products of combustion away therefrom, a plurality of space heating pipes connected at one of their ends in heat exchange relationship with the heat generating means in the furnace and adapted to be connected to a plurality of space heating means to circulate hot water from the furnace to the space heating means and back to the furnace, a plurality of potable water pipes connected with a source of potable water and with the heat generating means in the furnace to heat the potable water and circulate it to a point of use, a separate heat recovery means in the flue exposed to the heat of flue gases in the flue, a first plurality of heat recovery pipes connected to the heat recovery means and to the space heating pipes, and a second plurality of heat recovery pipes connected with the said heat recovery means and the potable water pipes, to reclaim at least part of the heat of the flue gas and to heat water in both the space heating means and the potable water pipes, and control means responsive to temperature in a space being heated and to the temperature of the hot potable water to alternately effect heat exchange between the heat recovery pipes and the space heating pipes, and between the heat recovery pipes and the potable water pipes, said control means including means to first effect supply of heat from the heat recovery pipes to the space heating pipes in response to demand and when the demand is satisfied to effect supply of heat to the potable water pipes, whereby the efficiency and economy of operation of the hot water heating system is greatly enhanced..

3,896,993

PROCESS FOR LOCAL MODIFICATION OF THE STRUCTURE OF FOG AND CLOUDS FOR TRIGGERING THEIR PRECIPITATION AND FOR HINDERING THE DEVELOPMENT OF HAIL PRODUCING CLOUDS

Roger Rene Serpolay, Brest, France, assignor to Etat Francais, Paris, France

Filed Sept. 10, 1973, Ser. No. 395,758
Claims priority, application France, Sept. 15, 1972, 72.32687
Int. Cl.[2] E01H *13/00*
U.S. Cl. 239—2 R **2 Claims**



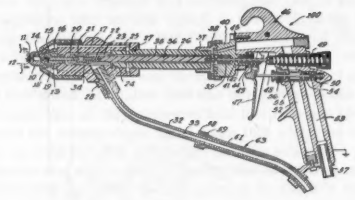
1. A method for locally triggering the precipitation of fog and clouds which comprises dispersing in the fog or clouds, particles of sodium alginate having a viscosity of 100 to 400 centipoises in 1.2 percent by weight aqueous solution at 18°C.

3,896,994

ELECTROSTATIC DEPOSITION COATING SYSTEM

Arvid C. Walberg, Lombard, Ill., assignor to Arvid C. Walberg & Co., Downers Grove, Ill.

Division of Ser. No. 237,523, March 23, 1972, Pat. No. 3,774,844, which is a continuation-in-part of Ser. No. 24,104, March 31, 1970, abandoned. This application July 30, 1973, Ser. No. 384,128
Int. Cl. B05b *5/02*
U.S. Cl. 239—3 **13 Claims**



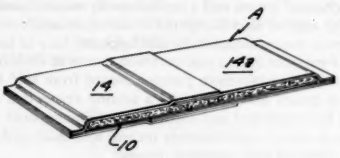
1. A coating system comprising:
a spray gun for atomizing and ejecting coating material into the atmosphere having a forward end provided with a passage therein said passage having an intake,
a container for holding coating material,
a high voltage supply connected between coating material in said container and work to be coated,
an electrically nonconductive fluid conduit having an internal cross sectional area and connecting said container and said intake to transport coating material from said container to said spray gun body passage, said conduit being sufficiently long in relationship to said cross sectional area to prevent arcing at the spray gun, and
means applying an electrostatic field to the atomized coating material ejected from said spray gun connected to said coating material at said spray gun.

3,896,995

FLYING INSECT REPELLANT ASSEMBLY

Jhon Lelicoff, 966 Heap Ave., San Mateo, Calif. 86301

Filed Apr. 12, 1974, Ser. No. 460,300
Int. Cl.[2] A61L 9/04; A01M 1/20; B32B 7/06
U.S. Cl. 239—36 7 Claims



1. A device for use in maintaining a quantity of a volatile insect repellant adjacent a desired portion of the human body without said insect repellant being in contact with said portion, said device comprising:

a. a first sheet of pliable material that is impervious to said insect repellant, said sheet having first and second sides;

b. a pad of absorbent material secured to a first side of said first sheet, said pad being of sufficient volume to absorb said quantity of insect repellant;

c. first adhesive means that cover at least a portion of said second side of said first sheet to permit said first sheet to be removably secured to said desired portion of the human body on the exterior surface of clothing covering said portion;

d. a hollow frame of a material impervious to said insect repellant that extends completely around said pad and with said frame secured to said first side of said first sheet;

e. at least one second pliable sheet that extends over said adhesive means and is lightly bonded thereto, said second sheet being removable from said adhesive means to permit said first sheet to be removably secured to said desired portion of the human body;

f. at least one third sheet of a material impervious to said insect repellant that extends across said frame outwardly from said pad, said first sheet, frame and third sheet cooperating to define a confined space in which said pad is disposed; and

g. means for removably sealing said third sheet to said frame to prevent said pad in said confined space from communicating with the ambient atmosphere until said third sheet is removed from said frame.

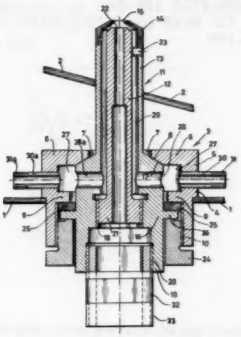
3,896,996

INJECTOR WITH HOLDER FOR AN AIR MIXER OR THE LIKE

Robert Jacques Roest, Bloemendaal, and Pieter van Ruitenberg, Hithoorn, both of Netherlands, assignors to Airprocess A.G., Altdorf, Switzerland

Filed Apr. 19, 1974, Ser. No. 462,539
Claims priority, application Netherlands, Apr. 25, 1973, 7305793
Int. Cl. B05b 7/00
U.S. Cl. 239—424 4 Claims

1. Injector with a holder for detachably disposing the injector in the bottom of a vessel receiving material to be treated by being introduced into the vessel and fluidified by blowing a gas from below into said vessel, the injector comprising an injector tube and an injector casing situated at some distance about the injector tube, said casing having at its upper end a closure with an opening corresponding to the outlet of said injector tube situated under said opening, the end portion of the wall of said casing turned away from the closure being outwardly thickened, the face of the thicker wall part turned towards the closure having a conically extending slant, the thicker wall part having at least one transverse channel connecting the outer peripheral surface of the injector casing with the space between injector tube and injector casing, said holder being hollow and comprising further a circumferential wall and on one side a transverse wall with a central opening having a cross-section smaller than the cross-section of the hollow space in the holder, the edge of the transverse wall



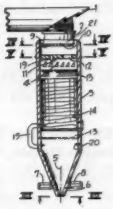
encircling said central opening and turned towards said hollow space having a conically extending slant so that after fitting the injector in the holder the conically extending faces of the injector casing and of the transverse wall of the holder, respectively, contacting each other at least at one location.

3,896,997

SPRINKLER DEVICE

William Sallows, Penticton, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 21, 1974, Ser. No. 481,679
Int. Cl. B05b 3/04, 3/16
U.S. Cl. 239—102 4 Claims



1. A sprinkler device, comprising

a feeder pipe for supplying water;

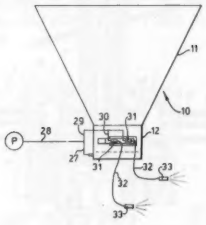
a coupling member opening into the feeder pipe and extending downward therefrom; and

a sprinkler housing rotatably mounted on the coupling member and having fins mounted circumferentially therein for rotating the housing about its axis when water from the feeder pipe impinges upon the fins, said housing tapering substantially conically to its bottom end and having a pair of nozzles extending substantially diametrically therefrom.

3,896,998
APPARATUS FOR SPRAYING PARTICULATE MATERIAL

Charles F. Vertue, Cooksville, Canada, assignor to Volstatic of Canada Limited, Canada

Continuation-in-part of Ser. No. 314,737, Dec. 13, 1972, abandoned. This application Feb. 1, 1974, Ser. No. 438,617
Claims priority, application Canada, Sept. 25, 1972, 152412; Dec. 18, 1973, 188393
Int. Cl.[2] B05B *15/02, 5/02;* **B65G** *53/42*
U.S. Cl. 239—106 **15 Claims**

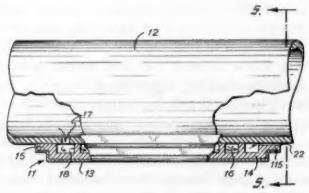


1. Particulate material spraying apparatus comprising:
a container for particulate material;
an extractor device for extracting particulate material from said container;
a particulate material discharge device for discharging the particulate material;
an outlet duct connecting said extractor device to said discharge device;
said extractor device having an inlet nozzle and means defining an inlet passage extending through said nozzle, said nozzle defining a mouth at one end of said inlet passage, said nozzle having an outer surface which tapers towards said mouth and converges with said inlet passage at said mouth;
a gas discharge passage extending past the other end of said inlet passage;
means for discharging compressed gas through said gas discharge passage past said other end into said outlet duct, whereby particulate material is entrained from said inlet passage and driven through said outlet duct to said discharge device; and
a vibrator for vibrating said nozzle to counteract accumulation of the particulate material on said nozzle.

3,896,999
ANTI-CLOGGING DRIP IRRIGATION VALVE

Jaime Sahagun Barragán, Calle del Teco 287, Michoacan, Mexico

Filed Sept. 23, 1974, Ser. No. 508,631
Claims priority, application Mexico, Sept. 28, 1973, 146470
Int. Cl. B05b *1/32, 15/02*
U.S. Cl. 239—107 **10 Claims**

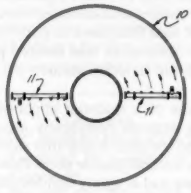


1. An anti-clogging drip irrigation valve which comprises a flat relatively thick elongated assembly having a flexible film cover member, a relatively thick highly flexible member laminated to said cover member, at least one elongated channel means opening towards one of the faces of said highly flexible member opposite to the face laminated to said cover member, a plurality of partition means integrally formed with said highly flexible member and located within said elongated channel means in order to form labyrinth conduit means with a first cavity means formed at one of the ends of said elongated channel means and a second cavity means formed at the opposite end of said elongated channel means; complementary cover means attached to said opposite face of said highly flexible member and to said partition means at their free ends, so as to form a labyrinth passage means from said labyrinth conduit means and a first and a second respective chamber means from said first and second cavity means; fluid entrance means at one of said chamber means; and fluid outlet means at the other of said chamber means.

3,897,000
MULTIPLE JET AERATOR MODULE

Mikkel G. Mandt, Prophetstown, Ill., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Nov. 8, 1973, Ser. No. 413,824
Int. Cl. E03c *1/084;* **B05b** *3/12, 7/32*
U.S. Cl. 239—177 **17 Claims**

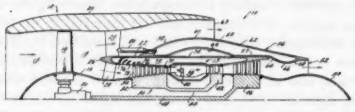


1. A multiple jet aerator module comprising a liquid duct including a tubular sheet-form member and a plurality of longitudinally spaced circumferentially aligned liquid nozzles, and an air duct including a sheet-form member mounted on said liquid duct to form a passage therebetween and including a plurality of longitudinally spaced circumferentially aligned liquid-air nozzles,
said liquid-air nozzles corresponding in number to and being disposed respectively in radial alignment with said liquid nozzles.

3,897,001
NOZZLE AND AUXILIARY INLET ARRANGEMENT FOR GAS TURBINE ENGINE

Augustus Mason Helmintoller, Jr., Loveland, and Robert Gerald Beavers, Mason, both of Ohio, assignors to General Electric Company, Lynn, Mass.

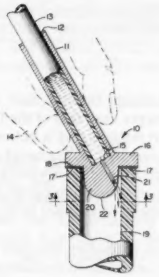
Filed June 12, 1974, Ser. No. 478,702
Int. Cl. B64d *33/04*
U.S. Cl. 239—265.13 **5 Claims**



1. A gas turbine engine of the bypass type comprises:
a core engine comprising a compressor, combustor and turbine in serial flow relation and a core exhaust nozzle;
a bypass duct around the core engine with a bypass exhaust nozzle, and

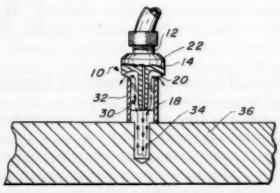
translating shroud means disposed intermediate the bypass duct and core engine for simultaneously varying the exit areas of the core and bypass exhaust nozzles.

3,897,002
LIQUID WASH INJECTOR
Michael E. Witty, El Toro, Calif., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.
Filed Aug. 14, 1974, Ser. No. 497,419
Int. Cl. B05b *1/28, 15/04*
U.S. Cl. 239—288 **4 Claims**



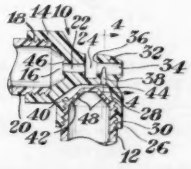
1. A device for introducing liquid into an open mouthed elongated receptacle comprising an elongated tubular means adapted and constructed to have attached thereto at the proximal end a liquid carrying conduit, said tubular means terminating at the distal end with an outwardly extending annular flange for seating on the mouth of said receptacle, said tubular means being inclined with respect to said flange, said flange having at the other side thereof a projecting means having an axis normal to the flange, said projecting means having a bore therethrough communicating internally with said tubular means and in axial alignment therewith, for liquid impingement on the upper part of the inner side-wall of said receptacle.

3,897,003
BLOWOUT NOZZLE
William J. Zehr, Des Plaines, Ill., assignor to The Protectoseal Company, Bensenville, Ill.
Filed Feb. 19, 1974, Ser. No. 443,214
Int. Cl. B05b *1/10, 1/28*
U.S. Cl. 239—288.5 **6 Claims**



1. A blowout nozzle comprising a cylindrical housing having upper and lower walls, an upwardly extending, axially positioned shank integrally formed on the upper wall of said housing, an axial core extending downwardly from said housing, equi-distantly spaced vanes extending outwardly from said core and downwardly from the lower wall of said housing and inwardly of the periphery of said housing, the lower wall of said housing between each of said vanes having a cutout to form a dome-like shape, the diameter of the housing being greater than the width of the vanes, an axial aperture extending through said shank, housing and core, and a cylindrical sleeve covering said vanes and extending below the lower ends of said vanes.

3,897,004
SPRAY NOZZLE BOTTLE CAP
Floyd R. French, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed July 16, 1973, Ser. No. 379,864
Int. Cl. B05b *7/30*
U.S. Cl. 239—318 **4 Claims**

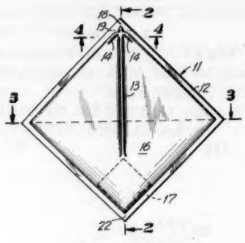


1. A one-piece spray nozzle for mixing a second fluid with a first carrier fluid comprising a first extension adapted for connection with a source of first carrier fluid, a dip tube free second extension adapted for connection with a source of second fluid and a discharge nozzle having an aspirator chamber therein, said first extension and discharge nozzle having an air gap therebetween, said first extension having a jet passageway communicating with the source of first carrier fluid and the air gap, said aspirator chamber having an inlet opening disposed adjacent the air gap and an exit opening to the exterior of said spray nozzle, said inlet opening being larger than the exit hole of the jet passageway and being disposed in line therewith, said second extension having a dip tube free feed passageway in communication with the source of second fluid and the aspirator chamber and adapted to educt the second fluid into the aspirator chamber as the first carrier fluid passes through the aspirator chamber, said first extension and said second extension having like sockets so that the first extension can be connected to the dispensing end of a container of second fluid as a sealing closure and alternatively to the source for said first carrier fluid, said first extension including a sealing edge adapted to engage a sealing portion at the dispensing end of the container extending further into the socket portion than the comparable portion of the second extension such that when the socket of the second extension is engaged with the container a gap is formed, said gap communicating with an opening in the second extension and forming an air bleed hole.

3,897,005
CONVENIENCE SPRAY DISPENSING PACKET
George Reiner, 527 Madison Ave., New York, N.Y. 10022
Continuation-in-part of Ser. No. 305,747, Nov. 13, 1972, abandoned. This application Aug. 31, 1973, Ser. No. 393,380
Int. Cl. B65d *1/32*
U.S. Cl. 239—327 **18 Claims**

1. A convenience packet of relatively small weight and volume for dispensing a fluid in spray-form, comprising two oppositely disposed flexible walls, said walls being sealed together at the peripheral edges thereof, resilient means for normally holding said walls apart, and a branched tube within said packet, said branched tube consisting of a main stem having two ends, one of said ends being proximate one edge of said packet defining a corner and the other of said ends being within the body of said packet, and at least one side-tube joining said main stem at an angle and proximate said one end, said corner being adapted for easy removal to expose said one

end, the lengths of said main stem and said branched tube being such that said other end of said main stem is immersed

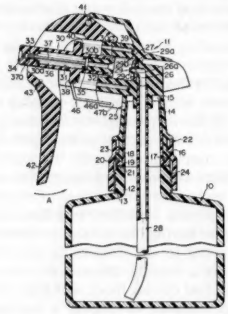


in such fluid as may be within said packet and said side-tube is above said fluid when said corner is uppermost.

3,897,006
SPRAYER

Tetsuya Tada, 1339 Nishitakadomari, Onoda-shi, Yamaguchi-ken, Japan

Filed Dec. 20, 1974, Ser. No. 534,891
Claims priority, application Japan, Sept. 9, 1974, 49-103637
Int. Cl.² B05B 1/32, 11/02
U.S. Cl. 239—333 **7 Claims**



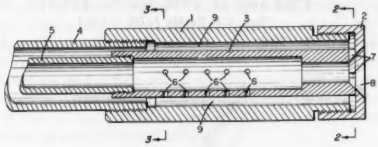
1. In a sprayer including a sprayer head having a cylindrical bore, a piston slidably inserted into said cylindrical bore and a container for receiving a spray liquid therein, whereby, when operated, the piston permits the spray liquid to be sucked from the container into the cylindrical bore through pipe means and subsequently ejected from a nozzle at the tip end of the piston, the improvement comprising a neck portion formed in integrity with said sprayer head and coupled to said container, said neck portion having a vent for permitting the interior of the container to communicate with the open air, flexible closing means for normally closing said vent, operating means for deforming said closing means in accordance with the sliding movement of the piston to open said vent.

3,897,007
APPARATUS FOR ATOMIZING LIQUID FUELS FOR THE COMBUSTION PROCESS

Joseph G. Roy, 1204 Shelter Way, South Charleston, W. Va. 25309

Filed Sept. 10, 1973, Ser. No. 395,703
Int. Cl. B05b 7/10, 7/06
U.S. Cl. 239—403 **2 Claims**

1. In combination with a steam, air or other conventional atomizing medium/liquid fuel burner nozzle capable of passing large volumes of liquid fuel, having a liquid supply conduit to an inner body at its forward end, having means to supply and introduce atomizing medium into the inner body for the purpose of decreasing the fuel density and producing a rotary action to the fuel and having means to impinge atomizing medium tangentially onto and into the exiting stream to externally atomize the liquid with a resultant pattern in the shape of a solid cone, the improvements comprising:

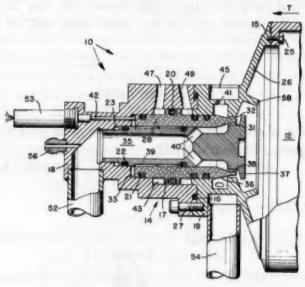


a. a singular fuel passage through said inner body with a flow area that is larger than that of the fuel supply conduit and having an exit portion that is between about one half and about one times that of the supply conduit.
b. a plurality of ports extending inwardly from said atomizing supply means and in communication tangentially with the internal volume of said inner body in advance of the exit portion,
c. a plurality of ports extending inwardly from said atomizing supply means and in communication tangentially with the exit of said singular fuel passage.

3,897,008
LIQUID FUEL INJECTOR SYSTEM

Ronald F. Dettling, China Lake, Calif., and Donald G. Nyberg, Burton, Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 24, 1969, Ser. No. 862,641
Int. Cl.² B05B 7/12
U.S. Cl. 239—410 **1 Claim**



1. Metering and injecting apparatus for bireactant gas generator comprising, in combination:
a body member having a bore and a counterbore;
pintle means in said bore and forming, with said counterbore, an annular cylindrical chamber defined by inner and outer opposing surfaces and an annular opening;
a valve member surrounding said pintle means and axially movable within said chamber;
said valve member having a tapered portion defined by inner and outer isogonic frustum surfaces;
said tapered portion mating with a cylindrical end piece;
said end piece protruding into said annular opening;
said valve member forming with said opening an inner annular metering channel and an outer annular metering channel, each of said channels having a receiving end and a discharge end;
said metering channels being parallel to each other for a distance along said end piece so that fluid will be dis-

charged therefrom in a first path defined by parallel concentric cylindrical streams;

said channels being opened or closed under positioning of said valve member for metering reactant flow rate;

means for controllably moving said valve member; and

first and second conduit means conveying first and second liquid propellants at substantially constant supply pressure to the receiving end of one and the other of said channels, respectively; said valve member with said frustoconical surfaces in cooperation with the edges of said annular opening constituting the sole means for metering the liquid propellants; and

said pintle means including a flange member having a conical surface which extends across the path of both fluid streams; so that said streams will impinge individually and separately on said conical surface and be deflected substantially coincidentally along a second path.

3,897,009

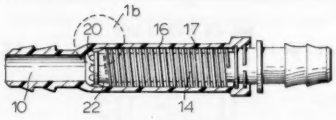
TRICKLE IRRIGATION SYSTEM

Javier Rangel-Garza, and Jaime Leal-Diaz, both of Escobedo 733, Sur Suite 316, Monterrey, Nuevo Leon, Mexico

Continuation of Ser. No. 159,663, July 6, 1971, abandoned. This application Apr. 2, 1973, Ser. No. 346,997

Int. Cl. B05b *15/00*

U.S. Cl. 239—542 **2 Claims**



1. A trickle irrigation system comprising in combination, two pieces of tubing and an in line trickler of substantially the same size as said tubes affixed therebetween, said trickler having a generally cylindrical male member with a friction fir coupling member on one end for engaging the inner wall of one piece of the tubing to frictionally hold it therein in a fluid tight connection, said male member defining by helical ridges extending therefrom on the outer periphery, a longitudinal central aperture therethrough in which fluid may flow from said tubing, a generally hollow cylindrical mating female member with a smooth interior surface adapted to rest on said ridges and thereby establish a water flow path through the helical path formed by said ridges and further including structure to receive and hold said male member therein at one end and having at the other end a friction fit coupling member to engage the inner wall of the other piece of tubing to frictionally hold it therein in a fluid tight connection and defining a longitudinal aperture therethrough mating with that of the male member so that fluid will flow through said trickler from one tube to the other, and wherein said male and female members have structure disposed therebetween when mated for defining a passageway permitting a portion of the fluid flowing through said tubes to trickle out between the two members comprising, a feeding chamber insuring the continuous flow of water between the two members formed by structure on the butt end of said male member forming a cavity for receiving fluid passing through said tubes and directing it into said helical ridges wherein said ridges have a longitudinal regulating duct disposed therethrough over a portion of said ridges to define a water conveying passageway bypassing said helical path.

3,897,010

METHOD OF AND APPARATUS FOR THE MILLING OF GRANULAR MATERIALS

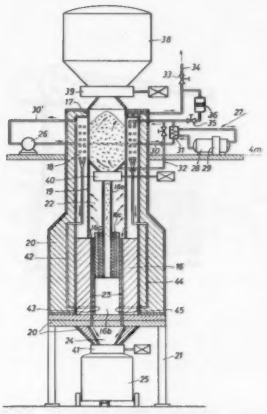
Josef Weishaupt, Pullach, and Jakob Oberpriller, Baierbrunn, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Continuation of Ser. No. 268,134, June 30, 1972, abandoned. This application Feb. 7, 1974, Ser. No. 440,446

Claims priority, application Germany, July 2, 1971, 2133019

Int. Cl. B02c *19/06*

U.S. Cl. 241—5 **1 Claim**



1. A method of comminuting pieces of a material comprising the steps of:

a. confining a supply of said material with a wall and cooling said supply of material by heat exchange with a gas through said wall;

b. compressing said gas after psssing it in heat exchange with said supply of said material through said wall;

c. cooling the gas compressed in step (b) by passing it in heat exchange with a recirculated external coolant to produce a cold fluid;

d. expanding a portion of the cold fluid produced in step (c) and passing the expanded portion of said fluid through said supply in direct contact with said material whereby water and other vapor is entrained with said portion;

e. passing the remainder of the cold fluid produced in step (c) in indirect heat exchange with the gas cooling said supply of material in step (a);

f. metering said material into a jet mill after said material is contacted with said portion of said cold fluid in step (d);

g. pulverizing said material to a powder in said jet mill by entrainment of said material in the fluid passed in indirect heat exchange with said gas in step (e);

h. separating the fluid used to pulverize said material in step (g) from the resulting powder; and

i. feeding the fluid separated in step (h) as the gas employed in step (a).

3,897,011

THERMOPLASTIC WASTE CONVERTER

Bob P. Gray, and James A. Gray, both of 503 Summit Ave., Gainesville, Tex. 76240

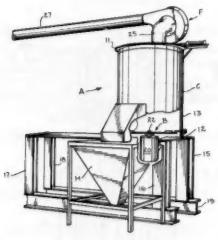
Filed Nov. 12, 1973, Ser. No. 414,742

Int. Cl. B02c *1/00*

U.S. Cl. 241—15 **2 Claims**

1. A method of processing thermoplastic film material to convert it into granular form, comprising the steps of:

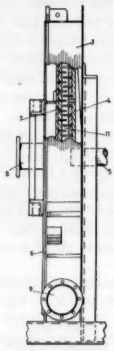
a. placing a first batch of approximately thirty pounds of thermoplastic foil material into a container having a cutting blade rotating therein at a speed of approximately 1800 r.p.m.;
b. placing a second batch of approximately seventy to eighty pounds of thermoplastic foil material in said container approximately one minute after said first batch is placed in said container with said blade continuing to rotate in said container;
c. rotating said blade in said container for a period of approximately 22 seconds after said second batch is placed in said container;



d. thereafter, spraying approximately sixteen ounces of water into said container and continuing to rotate said blade for another period of approximately 23 seconds;
e. injecting approximately one quart of water into the container with the blade continuing to rotate;
f. rotating said blade for an additional period of approximately 5 seconds following the addition of the quart of water;
g. spraying approximately 16 to 32 ounces of water into said container to cool the batches of thermoplastic material therein;
h. applying a negative pressure to the container to exhaust moisture and gases therefrom;
i. discharging the dry, granulated, processed material from the container.

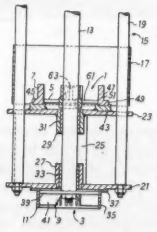
3,897,012
PULPING MACHINES
Johannes Daniel Malan, Stellenbosch, South Africa, assignor to Tobacco Research and Development Institute Limited, Zug, Switzerland
Filed Dec. 27, 1973, Ser. No. 428,913
Claims priority, application South Africa, Jan. 17, 1973, 73/0336; May 7, 1973, 73/3072; Aug. 31, 1973, 73/5997
Int. Cl.[2] B02C *1/06*
U.S. Cl. 241—27 **8 Claims**

1. A fruit pulping machine comprising a rotatable surface and a stationary surface located at a fixed distance apart, a series of pegs projecting from each surface, an inlet for fruit at a first position where fruit is fed between the surfaces, and an outlet for pulp at a second position spaced from the first and so located that fruit moving from the first to the second positions intersect the line of movement of the pegs, the distance between the pegs and the distance between the tips of the pegs and the opposed surface being so chosen that the pips of the fruit are not damaged in passing between the pegs and between the pegs and the opposed surface and wherein the pegs are inclined to the surfaces, those on the rotatable surface being inclined towards the periphery of the surface and against the direction of rotation and those on the stationary



surface being inclined towards the periphery of the surface and in the direction of rotation of the rotatable surface.

3,897,013
DISINTEGRATED DEVICES
Gordon David Love, Chesham, England, assignor to Silverson Machines Limited, Chesham, England
Filed Dec. 15, 1972, Ser. No. 315,309
Claims priority, application United Kingdom, Dec. 17, 1971, 58880/71
Int. Cl. B02c *18/08*
U.S. Cl. 241—46.11 **9 Claims**



1. A disintegrating device comprising a rotor and a cooperating stator,
wherein the rotor comprises an elongated shaft, a rotor plate mounted on the shaft, and a plurality of blades outstanding from the rotor plate,
the stator comprises a base member and a plurality of stator elements extending outwardly from the base member towards an inlet to the stator, the stator elements being disposed at locations angularly spaced about the rotor shaft and each stator element having a cutting edge formed by the intersection of a radially inner face of the stator element and an adjacent side face, at least part of which side face extends away from the base member towards the stator inlet in a direction outwardly of the stator element so that the width of said part of the side face increases away from said base member and inclined to the rotor shaft, and
the rotor is arranged with the rotor blades within the stator, on the side of the rotor plate facing the stator inlet, and is adapted, upon rotation, to draw material in which the device is immersed in a generally axial direction towards the stator inlet, whereby lumps of the material are reduced in size by impinging against the stator elements and, upon such reduction in size, are able to move further

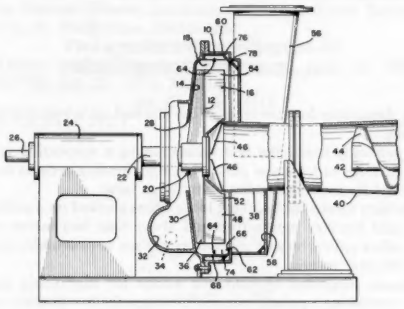
into the spaces between adjacent stator elements and to spend an increased time in contact with a cutting edge, such movement being assisted by the inclination of the said at least part of each adjacent side face.

3,897,014

MATERIAL DISINTEGRATING-AND-BLOWING APPARATUS

Oscar Luthi, Nashua, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed May 13, 1974, Ser. No. 469,448
Int. Cl.[2] B02C *13/10, 13/288*
U.S. Cl. 241—56 21 Claims



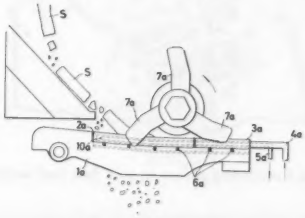
1. Material disintegrating-and-blowing apparatus comprising housing means, dividing means dividing said housing means into a material chamber on one side of said dividing means and a gas chamber on the other side thereof, rotatably driven vane means in said material chamber having inner end means and outer end means, said housing means having material inlet means for supplying material to said material chamber between said inner end means of said vane means whereby, during driven rotation of said vane means, such material passes outwardly between said vane means and is discharged from between said outer end means of said vane means, means in said housing means intermediate said inner end means and said material inlet means for breaking-up compacted material supplied through said material inlet means prior to the supply of such material to said inner end means, said housing means having blowing gas inlet means for supplying blowing gas into said gas chamber separately from the material supplied to said material chamber, material disintegrating means in said material chamber spaced outwardly from said outer end means of said vane means and in the path of material discharged from between said outer end means, said vane means being rotatable relative to said material disintegrating means, said housing having material outlet means communicating with said material chamber for discharging material from the space between said outer end means and said material disintegrating means, means including passage means peripherally of said dividing means for causing blowing gas supplied by said blowing gas inlet means to flow from said gas chamber through the space between said outer end means and said material disintegrating means for blowing the disintegrated material through said material outlet means, and ramp means intermediate said material disintegrating means and said material outlet means for restraining heavier material from passing to said material outlet means.

3,897,015

CRUSHER PLATE

Masao Suzuki, and Masayuki Oguni, both of Tokai, Japan, assignors to Nippon Steel Corporation, Japan

Continuation of Ser. No. 238,852, March 28, 1972, abandoned. This application Mar. 7, 1974, Ser. No. 448,950
Claims priority, application Japan, Apr. 1, 1971, 46-23153; Aug. 9, 1971, 46-71091
Int. Cl. B02c *11/08, 13/02*
U.S. Cl. 241—66 5 Claims



1. In a crushing apparatus for crushing hot sintered materials, said apparatus including a crusher plate formed with a plurality of spaced elongated crushing members and a rotary member having projecting blades rotating in intermeshing relationship with said crusher plate to effect therebetween crushing of said sintered materials, said blades extending to between said crushing members, the improvement comprising, in combination, means defining a jacket chamber interiorly of said crushing members said jacket chamber being formed by structuring said crushing members in a hollow box-like configuration, means for supplying a fluid cooling medium to said jacket chamber, means for exhausting said cooling medium from said jacket chamber, and liner means integrally bonded with said crushing members and covering said crushing members at least along portions thereof at which said sintered material is brought into contact with said crusher plate.

3,897,016

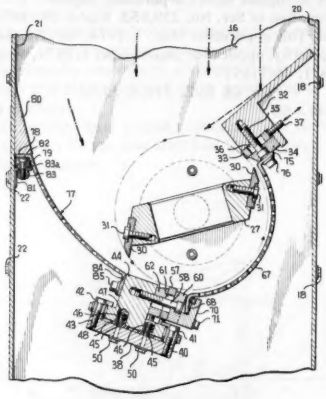
GRANULATOR WITH NOISE ABATEMENT AND SAFETY MEANS

Sunil Chunilal Shah, Cranston, R.I., assignor to Cumberland Engineering Company, Inc., South Attleboro, Mass.

Filed Mar. 27, 1974, Ser. No. 455,125
Int. Cl.[2] B02C *18/06, 18/44*
U.S. Cl. 241—73 7 Claims

1. Apparatus for comminuting plastics and like materials wherein said mechanism includes a rotating cutter element and a cooperating fixed cutter element, the combination comprising, mounting means for mounting said fixed cutter element, fixed support means for holding said mounting means, said mounting means being movable in said support means in a first direction corresponding generally to the direction of rotation of said cutter element and in a second direction generally perpendicular to said first direction, and resilient means interposed between said support means and said

mounting means and operable to insulate said mounting means from said support means while affording limited move-



ment of said mounting means in said first and second directions.

3,897,017

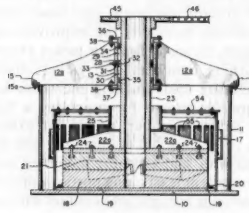
GRINDING MILL

Leo R. Rogers, 1182 Browning Ave., Salt Lake City, Utah 84105, and Leo A. Rogers, 217 Oleander Way, El Paso, Tex. 79922

Continuation of Ser. No. 271,289, July 13, 1972, abandoned. This application Mar. 29, 1974, Ser. No. 456,038

Int. Cl. B02c *1/00*

U.S. Cl. 241—205 **10 Claims**



3. A grinding mill having

a fixed lower grinding shoe with a plurality of asymmetrical camming surfaces on an upper face thereof;

a movable upper grinding shoe positioned above the fixed lower grinding shoe and having a plurality of asymmetrical camming surfaces on a lower face thereof, in mating relationship to the camming surfaces on the lower grinding shoe and a hole centrally through said upper shoe;

a bearing housing;

a cylindrical drive shaft fixed to and extending above the upper grinding shoe on the face opposite to the camming surfaces thereof and surrounding the hole therethrough, said shaft extending upwardly through the bearing housing;

drive means for rotating said drive shaft and the upper grinding shoe affixed thereto about a vertical longitudinal axis through the drive shaft, said drive means being fixed to the drive shaft above the bearing housing; and

flexible means extending at least partially around the means for rotating said drive shaft to rotate said shaft while allowing for reciprocation thereof.

3,897,018

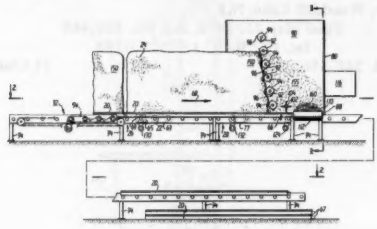
METHOD AND APPARATUS FOR THE CONTINUOUS FEEDING OF PALLETIZED FIBER MATERIALS

Lambert H. Wilkes; Gary L. Underbrink, both of College Station, Tex., and Joseph K. Jones, Raleigh, N.C., assignors to Cotton, Incorporated, New York, N.Y.

Filed Feb. 6, 1974, Ser. No. 439,846

Int. Cl. B65b *69/00*

U.S. Cl. 241—223 **11 Claims**



1. Apparatus for removing fibers stacked on a pallet comprising:

a generally horizontal bed means having a supporting surface for at least one pallet, having a loading zone at one end thereof and having a discharge zone;

breaker means for breaking loose fibers stacked on a pallet, said breaker means disposed above said bed means to allow pallets on said supporting surface to pass under said breaker means;

means supported by said bed means for supporting and translating a pallet from said loading zone to a position on the opposite side of said breaker means, whereby fibers stacked on the pallet are engaged by said breaker means and broken away from the rest of the fibers carried on the pallet as the pallet passes under and beyond said breaker means; and

discharge means above said bed means, said discharge means for conveying fibers removed from a pallet by said breaker means to subsequent fiber handling apparatus.

3,897,019

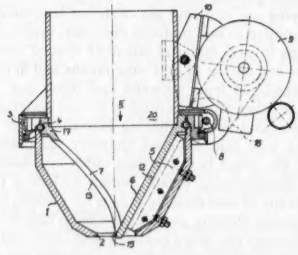
MACHINE FOR CRUSHING AND CUTTING LARGE OBJECTS

Georg Klein, Morfelder Str. 40, Walldorf; Kurt Rössler, Ringstr. 28, Belm; Karl Brockschmidt, Brockhagerstr. 70, Gutersloh, and Horst Rettweiler, Zum Mussenbach 3, Everswinkel, all of Germany

Filed May 23, 1973, Ser. No. 362,965

Int. Cl. B02c *7/08*

U.S. Cl. 241—257 R **14 Claims**



1. A machine for crushing large objects comprising:

a housing having a downwardly convergent, conical interior wall surface, said interior wall surface comprising an

inwardly protruding helical rib and defining upper and lower openings in said housing;

a conical funnel segment mounted within said housing between said upper and lower openings, said conical funnel segment having a downwardly convergent, conical exterior wall surface, said exterior wall surface comprising an outwardly protruding helical rib of opposite hand relative to said inwardly protruding helical rib; and

means for causing relative rotation between said housing and said conical funnel segment, whereby objects placed in said conical funnel segment through said upper opening are caught between said conical funnel segment and said housing, crushed by said helical ribs and forced toward said lower opening.

3,897,020

CUTTER KNIFE FOR THE PREPARATION OF MEAT

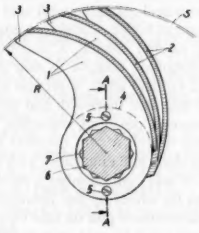
Fritz Knecht, Heissen, Germany, assignor to Firma Techmed AG, St. Margrethen, Switzerland

Filed Aug. 31, 1973, Ser. No. 393,483

Claims priority, application Germany, Aug. 31, 1972, 2242778; July 27, 1973, 2338145

Int. Cl. B02c *18/18*

U.S. Cl. 241—292.1 **5 Claims**



1. A cutter for the comminution of meat, comprising:

a knife shaft having a polygonal configuration;

a plurality of holding discs mounted on said shaft, each of said holding discs having a polygonal hole in form-fitting engagement with the polygonal shaft; and

a plurality of knife blades each carried by a respective one of said discs and having a convex cutting edge, a concave trailing edge, and an outer edge defining with said trailing edge a tip, said cutting edge terminating ahead of said tip whereby resharpening of the cutting edge is limited to the face of the blade and the radial distance between said tip and the axis of said shaft remains unchanged upon resharpening; each of said discs being provided with four bores spaced apart along a common circle centered on the axis of said shaft and oriented diametrically in two pairs with the lines connecting the centers of each pair of bores including angles of 75° and 105° with each other, said knife shaft being of hexagonal configuration and said holes of said discs being of decahedral configuration.

3,897,021

METHOD OF AND APPARATUS FOR SIMULTANEOUSLY PACKAGING GLASS STRANDS INTO INDIVIDUAL PACKAGES

Norman R. Shape, Pataskala, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed June 21, 1974, Ser. No. 481,607

Int. Cl. B65h *54/30, 59/38*

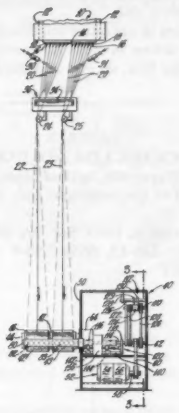
U.S. Cl. 242—18 G **14 Claims**

1. The method of simultaneously winding linear elements into more than one package comprising:

supplying at least two linear elements;

forming the advancing linear elements into more than one wound package each rotated at the same angular speed;

intermittently supplying an indication of the size of the



largest among all of the packages during their formation; and

modifying the angular speed of all of the packages together during their formation in response to the intermittently supplied indication of the size of the largest package.

3,897,022

ELIMINATE TAIL-ENDS OF YARN AND TO PICK UP THE END OF THE END OF THE WOUND YARN

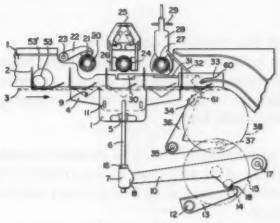
Luciano Savio, Pordenone, Italy, assignor to Officine Savio, S.p.A., Udine, Italy

Continuation of Ser. No. 143,480, May 14, 1971, abandoned. This application Sept. 17, 1973, Ser. No. 397,868

Claims priority, application Italy, May 18, 1970, 83331/70; Apr. 8, 1971, 83329/70

Int. Cl. B65h *67/08*

U.S. Cl. 242—35.6 E **18 Claims**



1. An apparatus for eliminating the tail-end winding at the base of a bobbin to thereby release the starting end of yarn in spinning cops, comprising:

a. a first operative station having means for supporting and rotating a bobbin and means adapted to cooperate with the rotating bobbin for loosening the tail-end winding at the base of the bobbin;

b. a second operative station having means for supporting and rotating a bobbin and means adapted to cooperate with the rotating bobbin for separating the tail-end from the cop;

c. a third operative station having means for supporting and rotating a bobbin and means adapted to cooperate with

the rotating bobbin for forcefully removing the tail-end from the cop;

d. means for picking up the thread end from either of the second and third operative stations and means for cutting from either of the second and third operative stations the tail-end removed; and

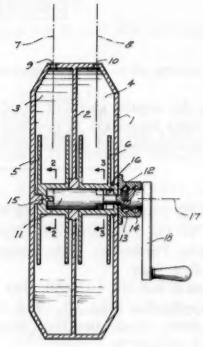
e. conveyor means in operative relationship to the operative stations, and driven in steps for positioning a bobbin in sequence in the first, second and third station.

3,897,023

CHALK LINE HOLDER

Cecil Couch, and Wayne Hix, both of Macon, Ga., assignors to The Raymond Lee Organization, Inc., New York, N.Y.; a part interest

Filed Oct. 4, 1973, Ser. No. 403,553
Int. Cl. B65h *75/34*
U.S. Cl. 242—100.1 **1 Claim**



1. A chalk line holder, comprising

a housing having a partition dividing the housing into two compartments, the housing having an aperture formed therethrough in each compartment for passage of a corresponding chalk line;

a shaft;

a pair of susbstantially coaxially mounted spools each rotatably mounted on said shaft in a corresponding one of the compartments, said shaft being axially slidable relative to said spools;

chalk line of a first desired color wound on one of the spools;

chalk line of a second desired color wound on the other of the spools;

coupling means for selectively coupling the shaft to a desired one of the spools for separate rotation by said shaft, the coupling means comprising a spline connection for each of said spools, said spline connection being coaxially positioned with the shaft and angularly displaced from each other in planes perpendicular to the axis of the shaft whereby axial displacement of the shaft in a predetermined direction engages a corresponding one of the spline connections with a corresponding one of the spools for rotation of such spool; and

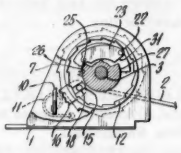
handle means outside the housing coupled to the shaft for manually rotating the spools.

3,897,024

AUTOMATIC LOCKING ACCELERATION ACTUATED VEHICLE SAFETY BELT RETRACTOR

Takezo Takada, deceased, late of Tokyo, Japan, and by Juichiro Takada, legalized authorized heir, Tokyo, Japan, assignors to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1974, Ser. No. 441,534
Claims priority, application Japan, Feb. 12, 1973, 48-16530
Int. Cl. B65h *75/48*
U.S. Cl. 242—107.4 **8 Claims**



1. An automatic locking safety belt retractor comprising a shaft, a take-up reel mounted on and rotatable with said shaft and spring biased to in a belt rewind direction, a safety belt connected to and retractable by and withdrawable from said reel, a first ratchet wheel rotatable with said reel, a first pawl mounted for movement between positions engaging and disengaging said first ratchet wheel, a second ratchet wheel mounted on and rotatable relative to said shaft, a fly wheel rotatably mounted on said shaft, a second pawl mounted on said fly wheel and movable therewith and movable relative to said fly wheel between positions engaging and disengaging said second ratchet wheel, a cam member mounted on and rotatable with said shaft and engagable with said second pawl whereby rotation of said cam member a predetermined angle in advance of said fly wheel by the rotation of said shaft in response to a predetermined pull on said belt effects the actuation of said second pawl by said cam member into engagement with said second ratchet wheel to forwardly rock said second ratchet wheel, and actuating means drive coupling said second ratchet wheel and said first pawl whereby forward rocking of said second ratchet wheel advances said first pawl into engagement with said first ratchet wheel to lock said reel against belt withdrawal rotation, said first and second ratchet wheels having equal numbers of ratchet teeth.

3,897,025

AUTOMATIC REWIND MECHANISM FOR A MOTION PICTURE PROJECTOR

Nicholas Mischenko, Mount Prospect, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 31, 1974, Ser. No. 474,995
Int. Cl.[2] B65H *59/38, 63/02;* **G03B** *1/04;* **G11B** *15/32*
U.S. Cl. 242—189 **6 Claims**

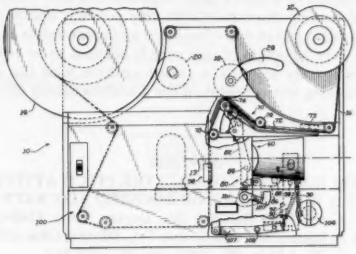
1. In combination with a motion picture projector having a supply reel with one end of a film attached thereto, a take-up reel, a forward projection mode, a rewind mode, a projection axis, a shuttle for moving said film across said projection axis; a mechanism for automatically rewinding said film across said projection axis comprising:

a motor driving means;

a first roller supported for movement from an ineffective position to an effective position for engaging the flanges of the supply reel, said first roller in said effective position being rotatable by said motor drive means for winding film on the supply reel;

a second roller supported for movement from an ineffective position to an effective position for engaging the flanges of the take-up reel, said second roller in said effective position being rotatable by said motor drive means for winding film on the take-up reel;

sensing means for sensing an increase in film tension incident to an end of run condition upon completion of forward projection of said film; and



control means responsive to said sensing means for automatically moving said second roller into said ineffective position and for moving said first roller into said effective position thereby rewinding said film from said take-up reel across said projection axis to said supply reel.

3,897,026

CINE PROJECTOR HAVING APPARATUS FOR REMOVING FILM FROM A CARTRIDGE

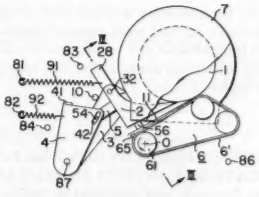
Kuniyoshi Suzaki; Yoshihiro Shigeta, both of Tokyo, and Torakiyo Yamanaka, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1969, Ser. No. 863,650

Claims priority, application Japan, Oct. 4, 1968, 43-87021[U]; Oct. 4, 1968, 43-87022[U]; Nov. 27, 1968, 43-103509[U]; Feb. 8, 1969, 44-10961[U]

Int. Cl. G03b *1/56, 23/02*

U.S. Cl. 242—192 **7 Claims**



1. An apparatus for removing film from a cartridge in combination with a cine projector comprising:

a film means pivotally mounted to said cine projector;

an initiating lever means pivotally mounted to said cine projector and having an elongated slot formed therein;

an intermediate lever pivotally mounted to said cine projector;

a switch lever having a pin protruding therefrom, said switch lever being pivotally mounted to said intermediate lever and said pin being slidably engaged in said elongated slot;

a stripper means pivotally mounted to said intermediate lever whereby rotation of said initiating lever in a first direction initiates rotation of said intermediate lever and said switch lever in said first direction to cause rotation of said stripper means in a second direction to engage thereby said film in said cartridge and to cause said switch lever to engage said film drive means to move said film drive means into engagement with the film in said cartridge.

3,897,027

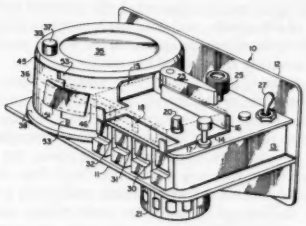
TAPE WINDING APPARATUS

Fred C. Bolick, Jr., Atlanta, Ga., assignor to Lanier Electronic Laboratory, Inc., Atlanta, Ga.

Division of Ser. No. 193,860, Oct. 29, 1971, Pat. No. 3,860,190. This application Aug. 27, 1973, Ser. No. 391,825

Int. Cl. G03b *1/04*

U.S. Cl. 242—195 **7 Claims**



1. Apparatus for selectively dispensing and winding a length of a flexible information recording tape wound on a tape winding member disposed within a tape package, comprising:

support means;

receptacle means disposed on said support means to releasably receive a tape package;

tape receiving means rotatably mounted on said support means in close proximity to said receptacle means; and

said tape receiving means having a peripheral tape receiving surface of width substantially greater than the width of such tape wound on the tape winding member within such tape package.

3,897,028

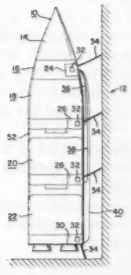
OPTICALLY LINKED MISSILE

O. Leonard Doellner, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sept. 10, 1973, Ser. No. 396,039

Int. Cl. F42b *15/00*

U.S. Cl. 244—3.1 **2 Claims**



1. In a missile composite structure comprising a re-entry system/payload, a missile guidance subsystem, and at least one power stage assembly all enclosed in a missile skin, apparatus for transmitting control signals and data between the missile guidance subsystem and the power stage assembly comprising:

a. first transformation means operably connected for responding to said control signals and data as first electrical signals and for transforming said first electrical signals into corresponding light signals;

b. fiber optic means operably disposed with one end adjacent to said first transformation means for receiving and transmitting said light signals between the missile guidance subsystem and the power stage assembly;

c. first shielding means for passing said fiber optic means through the skin of the missile adjacent to said first transformation means, said first shielding means containing a first hole for the passage of said fiber optic means;

d. a fiber optic raceway disposed adjacent to said first shielding means so as to receive said fiber optic means from said first shielding means, said fiber optic raceway being a conduit containing and protecting said fiber optic means, said fiber optic raceway being so shaped as to hold said fiber optic means adjacent to the external surface of the skin of the missile, said fiber optic raceway containing said fiber optic means being contained within an ablative coating covering the skin of the missile;

e. second shielding means for passing said fiber optic means through the skin of the missile adjacent to second transformation means, said second shielding means being disposed to receive said fiber optic means emerging from the end of said fiber optic raceway opposite the end of said fiber optic raceway adjacent to said first shielding means, said second shielding means containing a second hole for the passage of said fiber optic means; and,

f. second transformation means operably connected for responding to said light signals and for transforming said light signals into control signals and data as second electrical signals.

3,897,029

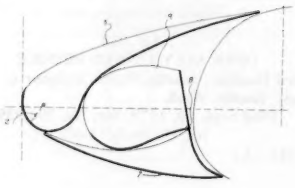
VARIABLE CAMBER MULTI-SLOTTED FLAPS

Alberto Alvarez Calderon, Avenida Salaverry 3465, Orrantio del Mar, Lima, Peru

Filed July 9, 1973, Ser. No. 377,621

Int. Cl. B64c *3/44*

U.S. Cl. 244—42 CA **8 Claims**



1. A variable geometry leading edge flap for a wing capable of modulated airflows to establish two slow speed aerodynamic regimes having different drag and lift characteristics and different angles of attack for maximum lift attained by varying the number of slots and the efficiency of the flap's chord comprising

a. an upper flap member which in a cruise disposition defines a leading edge and a forward upper surface portion of the wing's contour,

b. a lower flap member at least a portion of which in a cruise disposition contributes to define a forward lower surface portion of the wing's contour,

c. said leading edge flap having a landing disposition in which two slots are operative with aerodynamic flows being modulated with said lower flap member inverted from said cruise disposition downwardly and forwardly to a position increasing the camber and chord of said wing ahead of said wing and ahead of said upper member, with the trailing edge of said lower member being spaced from the leading edge of said upper member to define converging walls of a first upstream slot therebetween; and with the trailing edge of said upper member being spaced in said landing disposition from said wing's upper surface to define the walls of a second slot downstream of said first slot, and with said lower flap member inclined at a steep angle and modulating the flow on top of said upper member with the aid of flow through said first upstream slot, and modulating the flow on top of said wing by the combined beneficial effects of both said first upstream slot and said second slot,

d. with said leading edge flap being further characterized in that at least one of said upper flap member and said lower flap member is hinged so as to close one of said slots, defining a slow speed climb disposition of lower drag than said landing disposition with only one slot operative, in which the gap of one of said first and second slots extending over a portion of said wing is adapted to be reduced substantially towards a closed position with the other remaining slot constituting the aerodynamically effective slot.

3,897,030

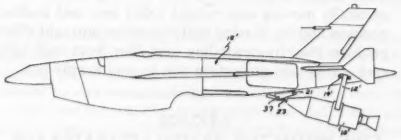
SYSTEM FOR CONTROLLING THE PITCH ATTITUDE OF A ROCKET MOTOR BOOSTED AIRCRAFT

John T. Cors, 1008 Beatrice Dr., Dayton, Ohio 45404, and Virgil B. Battenberg, 600 Grants Trl., Dayton, Ohio 45459

Filed Mar. 28, 1974, Ser. No. 455,816

Int. Cl. B64c *15/14;* **B64d** *41/00*

U.S. Cl. 244—63 **4 Claims**



1. In combination with a zero-length launch aircraft including a rocket motor; means for releasably supporting the rocket motor on said aircraft and means, connected between the rocket motor and the aircraft, for applying the thrust of the rocket motor to the aircraft; a rocket motor thrust vector pitch attitude control system, comprising: means, forming part of said supporting means for the rocket motor, for pivotably supporting the rocket motor, in pitch, on the aircraft; said means for applying the thrust of the rocket motor to the aircraft including a thrust frame secured to the aircraft; means, on said aircraft, for providing a pitch control signal; a linear actuator, responsive to said pitch control signal; means supported on said thrust frame and connected to said linear actuator for moving the rocket motor in pitch in response to movements of said linear actuator.

3,897,031

APPARATUS FOR PROVIDING SELECTED NAVIGATIONAL SYSTEM ENGAGE LOGIC

Willy B. Moses, Teaneck, and Nathaniel N. Moore, Bergenfield, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Mar. 15, 1974, Ser. No. 451,409

Int. Cl. B64c *13/20*

U.S. Cl. 244—77 B **9 Claims**

1. Apparatus for providing a signal which engages an aircraft navigational system selected by the pilot of the craft from systems of the type which transmit and receive navigational beams, comprising:

receiver means for providing a signal corresponding to the displacement of the aircraft from the centerline of the beam transmitted by the selected system;

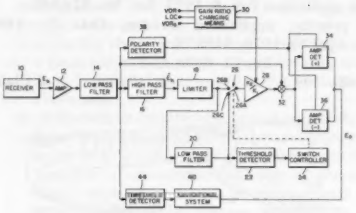
means for providing a signal corresponding to the rate of change of the displacement;

means for limiting the displacement rate signal;

means connected to the limiter for adjusting the gain of the limited displacement rate signal in accordance with a predetermined ratio of displacement rate signal gain to selective navigation system displacement signal gain;

means for changing the gain adjustment in accordance with the selected navigational system;

means for combining the limited, gain adjusted displacement rate signal and the displacement signal; and



means connected to the combining means and responsive to the combined signal for providing a signal for engaging the selected navigational system.

3,897,032

METHOD FOR OPERATING AIRSHIPS, PARTICULARLY BY MEANS OF HYDROCARBON GAS OR HYDROGEN

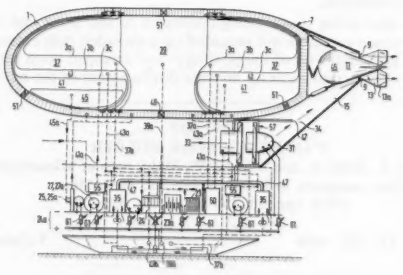
Hermann Ernst Robert Papst, Karl-Maier-Strasse 1, D7742 St. Georgen, Germany

Continuation of Ser. No. 227,887, Feb. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 119,335, Feb. 26, 1971, abandoned. This application Nov. 13, 1973, Ser. No. 415,321

Claims priority, application Germany, Feb. 26, 1970, 2009088

Int. Cl.[2] B64B *1/58*

U.S. Cl. 244—96 **11 Claims**



1. A method of operating an airship which is maintained buoyant in air by an original lifting gas which is inflammable and which is lighter than air, said method comprising carrying said original lifting gas in said airship as the sole fuel for generating driving power for the airship, consuming at least a part of the original lifting gas as fuel for supplying driving power for use by the airship thereby effecting a reduced buoyancy of the airship and restoring the reduced buoyancy by chemically converting a portion of the original lifting gas to a different gas species which has at least the same buoyancy effect as the gas which was consumed for supplying power and storing said gas species whereby all said lifting gas may be used for power production while maintaining buoyancy.

3,897,033

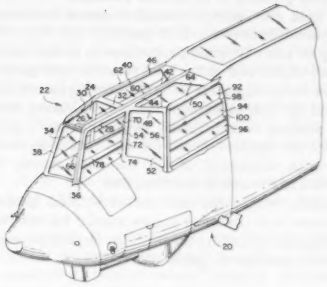
LOW GLINT HELICOPTER CANOPY STRUCTURE

David G. Harding, Brookhaven; John J. Schneider, Media, both of Pa., and Lawrence M. Mead, Jr., Huntington, N.Y., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 30, 1974, Ser. No. 438,092

Int. Cl. B64c *1/00*

U.S. Cl. 244—121 **15 Claims**



1. A low glint canopy structure for a helicopter, comprising:
a substantially flat top window;
a plurality of spaced, elongated fences extending longitudinally along said top window to screen said top window from low angle sunlight and block reflection of the sunlight from said top window;
a substantially flat windshield inclined downwardly and forwardly from said top window;
a fence located adjacent to said windshield to screen said windshield from low angle sunlight and block reflection of the sunlight from said windshield; and
a pair of side windows extending downwardly from said top window and rearwardly from said windshield.

3,897,034

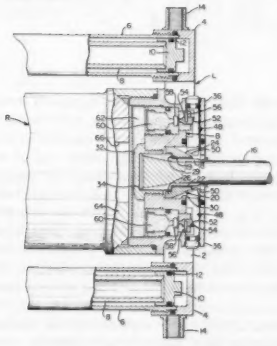
ROCKET ACTUATION DEVICE

Robert M. Stanley, Denver, Colo., assignor to Stanley Aviation Corporation, Denver, Colo.

Filed Oct. 15, 1973, Ser. No. 406,197

Int. Cl. B64d *25/10*

U.S. Cl. 244—122 AD **11 Claims**



1. Apparatus including ignition means for igniting a rocket of the tractor type wherein the rocket, having an elastic pendant having one end attached to the base of the rocket and the other end attached to the towed object, is catapulted so that the force exerted by the pendant after being pulled taut between the rocket and the towed object activates the rocket to pull the tow line, said apparatus comprising:

camming means surrounding the one end of the pendant and movable thereby longitudinally of the rocket from a first position to a second position;

force releasable securing means connecting the base of the rocket and said camming means to hold said camming means in its first position until a force is exerted upon said pendant of sufficient magnitude to release said securing means and permit said camming means to move from its first position to its second position;

at least one ignition actuation means mounted for lateral movement between a first position and a second position along an axis extending perpendicular to the longitudinal axis of said rocket and in the base thereof, said ignition actuating means being engagable by said camming means for movement of said ignition actuating means by camming action from its first position in a direction away from said camming means toward the ignition means for said rocket to its second position upon movement of said camming means from its first position to its second position; and

ignition means for said rocket located laterally outward from said camming means moved by movement of said ignition actuating means from its first position to its second position to ignite said rocket.

3,897,035
WALL FASTENER

Alan J. Solo, Brooklyn, N.Y., assignors to Knock-N-Lok International, Inc., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 469,666, May 14, 1974, which is a continuation-in-part of Ser. No. 463,820, Apr. 24, 1974, which is a continuation-in-part of Ser. No. 454,393, March 25, 1974. This application May 31, 1974, Ser. No. 474,872

Int. Cl. F16b *15/04*

U.S. Cl. 248—217 **11 Claims**

1. A wall fastener for use in relatively brittle penetrable walls comprising an elongate shank, said shank having one end thereof pointed and suitable for being driven into a penetrable wall; an engageable head at the other end of said shank suitable for being hammered to advance the pointed end of said shank through the penetrable wall and for being engaged to permit turning of said shank about the axis thereof; at least one transverse projection extending from said shank proximate to the pointed end, said projection being integrally formed with said shank and being flexible and resilient to permit the same to be deformed and at least partially wrapped about the axial length of said shank, whereby hammering the fastener into a penetrable wall causes the wall material to flex said projection to a position substantially coextensive with said shank, and engagement of said head and turning of the latter, to thereby cause simultaneous rotation of said shank about the axis thereof, causes said projection to flex and become twisted about said shank, the resiliency of said projections causing the same to tend to flare radially outwardly from the axis of said shank to become wedged between the latter and the wall material to thereby secure the fastener in place and resist the same from becoming removed from the wall.

3,897,036
VEHICLE CHAIR HAVING A RESILIENTLY SUPPORTED SEAT

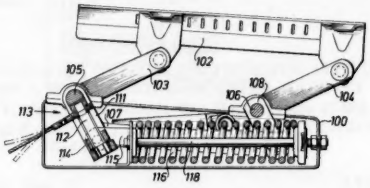
Karl Gösta Nystrom, Skeppargatan 13, Umea 902 52, Sweden

Continuation of Ser. No. 86,256, Nov. 2, 1970, abandoned. This application Feb. 5, 1973, Ser. No. 329,951

Claims priority, application Sweden, Oct. 31, 1969, 14971/69; Apr. 20, 1970, 5425/70

Int. Cl. B60n *1/02*

U.S. Cl. 248—399 **3 Claims**



1. A vehicle air comprising in combination:

a. a seat,

b. a support structure for the seat,

c. at least one pair of parallel supporting arms pivotally connected at one end to the seat and at the other end to the support structure, said arms forming opposite parallelogram links,

d. a pivot arm rigidly secured to one of said supporting arms to move in unison therewith,

e. spring means interconnecting said pivot arm and said support structure to counteract downward movement of the seat,

f. means for varying the attack point of said spring means on the pivot arm to permit an adjustment of the effective length of said arm and, hence, an adjustment of the resultant spring forces acting on the seat,

g. said spring means including at least one helical spring having a winding pitch varying along the length thereof so that said spring means will have a progressive spring coefficient,

h. said spring means being connected to said pivot arm by a non-rotatable nut mounted on a threaded bolt extending lengthwise of the pivot arm and arranged upon rotation thereof to cause an axial displacement of the nut.

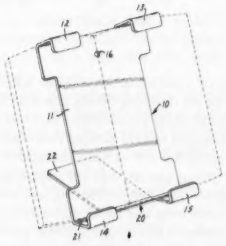
3,897,037
PAPERBACK BOOK HOLDER

Gary L. Johnson, and Michael W. Maki, both of Minneapolis, Minn., assignors to Dimason, Inc., St. Paul, Minn.

Filed Apr. 30, 1973, Ser. No. 355,729

Int. Cl.² A47B *97/04*

U.S. Cl. 248—460 **7 Claims**



1. A holder for maintaining a paperback book in an open

position, permitting the pages to be turned without removing the book from the holder, comprising in combination:

a. a generally flat body portion having top and bottom ends and having substantially the same width and height dimensions as said paperback book, formed of rigid sheet material, and

b. integral with said body portion,

i. at the top end thereof, turned outwardly therefrom for a fixed distance and then turned inwardly thereover so as to be parallel thereto, a first pair of laterally spaced claws, and

ii. at the bottom end thereof, turned outwardly therefrom for a fixed distance and then turned inwardly thereover so as to be parallel thereto, and lying parallel to said first pair of claws, a second pair of laterally spaced claws, each of said pairs of claws having inner and outer edges and the distance between the outwardly extending portions of said first and second pairs of claws slightly exceeding the height of said paperback book and the distance between the outer edges of each of said pairs of claws approximating the width of said paperback book, at least one pair of claws, before turning outward, extending slightly beyond the edge of the body portion with which said one pair of claws is integral, said one pair of claws and edge thereby defining a notch, and

c. a generally T-shaped support member having an upright and a cross bar, the cross bar of said T-shaped support member resting within said one pair of claws and the upright of said T-shaped support member extending through the notch so as to rest on a horizontal surface, thereby maintaining said holder at a predetermined angle.

3,897,038

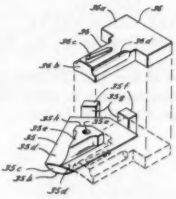
BLOWOUT PREVENTER WITH VARIABLE INSIDE DIAMETER

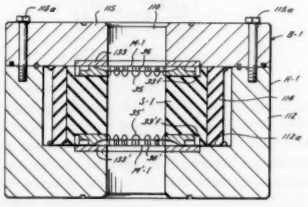
Robert K. Le Rouax, Houston, Tex., assignor to Hydril Company

Continuation-in-part of Ser. No. 325,529, Jan. 22, 1973, abandoned. This application Nov. 5, 1973, Ser. No. 412,538

Int. Cl. E21b *33/06*

U.S. Cl. 251—1 **12 Claims**





1. A blowout preventer adapted to seal with a pipe or other object in a well bore or to close same in the absence of any object in the well bore, comprising:

a resilient sealing member having an inner surface adapted to engage a pipe of the like in a well bore;

a rigid retainer plate mounted with the sealing member and having an inner surface generally conforming with the inner surface of said sealing member;

means for urging said sealing member radially inwardly relative to said inner surface of said plate for effecting a seal with a pipe or the like in a well bore or with itself for closing a well bore; and

first anti-extrusion means mounted with said plate' and movable radially relative thereto in response to radial inward movement of said sealing member for preventing extrusion of the sealing member longitudinally in the area radially inwardly of said plate when fluid pressure acts on said sealing member, said anti-extrusion means including:

a first set of anti-extrusion members spaced from each other and mounted for radial movement relative to said plate;

a second set of anti-extrusion members, each mounted alternatively with respect to two anti-extrusion members in said first set; and

interlocking means on said adjacent members for locking said adjacent members for radial movement together while premitting circumferential relative movement therebetween.

3,897,039

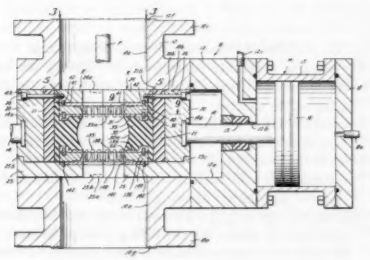
VARIABLE INSIDE DIAMETER BLOWOUT PREVENTER

Robert K. Le Rouax, Houston, Tex., assignor to Hydril Company

Continuation-in-part of Ser. No. 190,972, Oct. 20, 1971, abandoned. This application Nov. 5, 1973, Ser. No. 412,677

Int. Cl. E21b *33/06*

U.S. Cl. 251—1 **20 Claims**



1. A blowout preventer ram, comprising:

a ram carrier having an internal longitudinally extending ram sealing means recess;

yieldable sealing means adapted to fit in said ram sealing means recess and having an inner bore opening with a curved inner surface adapted to engage a well pipe or the like extending longitudinally and disposed inwardly of the sealing means,

a variable inner diameter upper anti-extrusion means disposed at the upper end of said yieldable sealing means; and

said anti-extrusion means including pipe engaging means secured to said sealing means and movable radially with said sealing means for providing a variable inner diameter thereof for engagement with the external surfaces of well pipes of varying diameters to prevent upward extrusion of said sealing means at each of the varying diameters of the pipes.

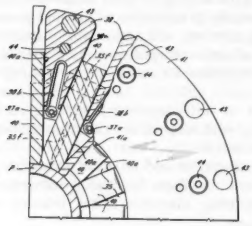
3,897,040
ANNULAR BLOWOUT PREVENTER WITH VARIABLE INSIDE DIAMETER

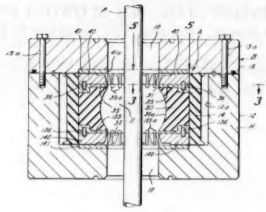
Robert K. Le Rouax, Houston, Tex., assignor to Hydril Company

Continuation-in-part of Ser. No. 359,443, May 11, 1973, abandoned, which is a division of Ser. No. 248,119, April 27, 1972, abandoned. This application Nov. 16, 1973, Ser. No. 416,376

Int. Cl. E21b *33/06*

U.S. Cl. 251—1 **12 Claims**





1. An annular blowout preventer, comprising:

an annular yieldable sealing means having an inner bore therethrough through which a well pipe or the like is adapted to extend;

a variable inner diameter upper anti-extrusion means disposed at the upper end of said yieldable sealing means;

said anti-extrusion means including plural pipe engaging means with said sealing means and overlapping adjacent ones of said pipe engaging means;

said plural pipe engaging means being movable radially with said sealing means for providing a variable inner diameter thereof for engagement with the external surfaces of well pipes of varying diameters to prevent upward extrusion of said sealing means at each of the varying diameters of the pipes; and

means for urging said sealing means and said pipe engaging means therewith radially inwardly to various inner diameters for sealing and engaging the pipe engaging means with the pipe.

3,897,041
FLUID FLOW CONTROL ELEMENTS WITH AREA DIVIDING INSERTS

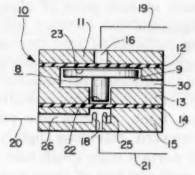
Larry C. Cowan, Saunderstown, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed Aug. 20, 1973, Ser. No. 390,123

Int. Cl.² F16K *31/365*

U.S. Cl. 251—61.1 **15 Claims**

1. A fluid logic amplifying control device for controlling a fluid flow path in response to a fluid pressure control force, comprising in combination, a movable control member having two opposing ends thereof presenting two surface contact areas, a fluid flow valve structure disposed for control by one of said ends and presenting a nozzle with contact surface structure thereabout smaller in surface contact area than that of one said end, whereby that end will overlap the nozzle contact surface, said nozzle structure including means for retaining between said one end and the valve a flexible diaphragm configuration that prevents fluid from distorting the diaphragm shape to extend into the nozzle under influence of fluid pressure, a pair of impervious flexible diaphragms disposed to contact the opposite said ends of said control member thereby to move it when flexed thereagainst, a first one of said diaphragms and its contact surface thereof with one end of said control member being relatively movable with respect to each other, said first one of said diaphragms being disposed between said control member and said valve structure, a pair



of pressure control chambers disposed adjacent each diaphragm to receive fluid flow under pressure for flexing said diaphragms against respective ends of said control member to thereby move it in opposite directions as a sole function of differential fluid pressures in said two control chambers on said diaphragms, a fluid flow path through said valve of an extended larger area permitting greater fluid flow volume in a first said chamber than in the second whereby in response to a smaller flow of fluid said one end of said control member may squeeze said first diaphragm against said nozzle to control a greater flow therethrough in response to differential pressure on said diaphragms in said pressure control chambers to effect amplification, and a housing holding said movable control member between said diaphragms for movement in and out of contact with said nozzle.

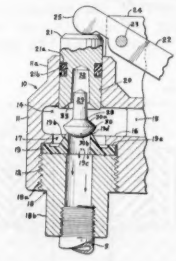
3,897,042
BALL COCK VALVE

Henry J. Kachergis, 335 Washington St., Waterbury, Conn. 06706

Continuation-in-part of Ser. No. 209,595, Dec. 20, 1971, abandoned. This application July 9, 1973, Ser. No. 377,398

Int. Cl.² F16K *33/00*

U.S. Cl. 251—77 **6 Claims**



1. A ball-cock valve comprising in combination a valve casing having a discharge chamber, an inlet port and an outlet port, a valve gasket member secured to said casing and having a portion extending upwardly into the discharge chamber, a boss projecting upwardly from said casing and having a cylindrical bore, a slide plunger slidably fitted in said bore, means

for actuating said plunger in said bore, wherein the improvement comprises the structure of the slide plunger having an axial closed-end socket opening through the base of said plunger and presenting an inner conical wall and a lower beveled seat, and a plunger seal member comprising a guide pin of frusto-conical shape and an enlarged head at its lower end, said guide pin being dimensioned to be spaced at all times from the conical wall of said socket whereby said pin will have a relatively loose free fit within said plunger socket, which loose free fit allows said seal member to fall freely and quickly into sealing engagement with said gasket member independently of the position and movement of said plunger, and when the valve is in open position said plunger seal member is held up within said plunger socket with its enlarged head seated against the adjacent face of said plunger by the force of water striking against said head.

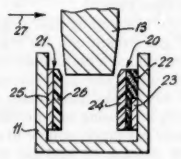
5. A ball cock valve comprising in combination a valve casing having a discharge chamber and an outlet port, a threaded opening provided in the base of said casing, a hollow bushing member fitted into said threaded opening and having means for connecting with a supply pipe, said casing having an upward boss provided with a central axial bore, a plunger slidably fitted in said bore, said improvement consisting in providing a partition wall between said threaded opening and said discharge chamber, said wall having an opening forming in fact a downward extension of said discharge chamber, a valve disc gasket held secure within said casing by being clamped between said partition wall and said bushing, said disc gasket having an upward hollow extension projecting into said chamber, said plunger having an axial closed end socket opening through its base end, and a valve stem dimensioned and positioned to provide a relatively loose free fit in said plunger socket, said stem having an enlarged head outwardly of said socket and cooperating with the extension of said valve gasket to effect a leak-proof seal when the valve is in a closed position, the loose free fit of said valve stem allowing said stem to fall freely and quickly independently of the position and movement of said plunger and cause the enlarged head to seat against the gasket upward extension.

3,897,043

FLUID FLOW CONTROL VALVES

Charles McBain, Stratford-on-Avon, and Francis Richard Need, Smethwick, both of England, assignors to Coplastix Limited, Cheshire, England

Filed Apr. 19, 1974, Ser. No. 462,409
Int. Cl. F16k *3/02*
U.S. Cl. 251—328 **12 Claims**



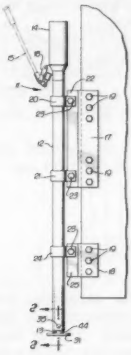
1. A valve comprising a sliding closure member slidable across an opening defined within a frame to control the flow of liquid through said opening, and a seal arranged between co-operating surface portions of said frame and said closure member respectively, said seal comprising a portion of resilient material bonded to one of said surface portions, and a bearing portion bonded to said resilient portion and adapted to bear on said other surface portion thus to slide thereon as the closure member is moved between its closed and open positions in operation of the valve, characterized in that a rigid insert is disposed between said bearing portion and the surface portion to which said resilient portion is bonded, whose thickness is less than that of said resilient portion, and adapted thus to limit the maximum compression of the resilient portion when the valve is closed, and said bearing portion has a lower co-efficient of friction than said resilient portion, with respect to said other surface portion.

3,897,044

CAMPER JACK

Erven Tallman, 15934 S. Figueroa St., Gardena, Calif. 92643

Filed May 15, 1974, Ser. No. 470,129
Int. Cl. B66f *7/26;* **B60s** *9/02*
U.S. Cl. 254—45 **5 Claims**



1. A jack for attachment to a vehicle and adapted to be carried thereby at a location in readiness for lowering to extended position, said jack comprising an inner hollow tubular rod and an outer hollow tubular rod in telescoping relationship, a free end of the outer of said tubular rods having a cylindrical walled hole in the wall of the tubular rod at a location spaced from and adjacent a free end of said outer tubular rod, the inner of said tubular rods having a cylindrical walled hole at a location spaced from and adjacent a free end thereof of substantially the same size as said first identified cylindrical walled hole, and a button having a diameter providing a free sliding fit of said button in said holes, the button having a length about equal to the aggregate depth of said two holes, and spring means biased in a direction adapted to extend the button into said holes when the holes are in alignment in retracted position of the inner of said tubular rods, and spring means comprising a flat spring member having a convex outer face parallel to the longitudinal axis of said inner tubular rod and having a width greater than the diameter of said button and an arcuate length slightly less than the inside circumference of said inner tubular rod, said button having an inward extension thereon anchored to the flat spring intermediate its ends, portions of said spring member on opposite sides of said button being substantially equal in length and extending for substantially equal distances around the inside wall of said inner tubular rod.

3,897,045

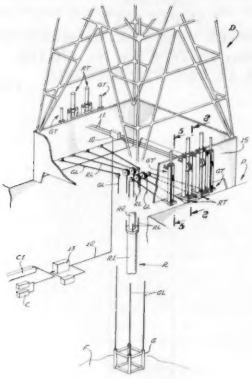
RISER PIPE AND GUIDE LINE TENSIONING APPARATUS

Bryan V. Butler, Ventura, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Sept. 12, 1973, Ser. No. 396,493
Int. Cl. B66d *1/50*
U.S. Cl. 254—172 **21 Claims**

1. In tensioning apparatus for maintaining tension on a line: a support adapted to be fixed to a floating platform block means secured to said support, elongate accumulator cylinder means fixed to and carried by said support, traveling block means, both of said block means being adapted to receive a line to be tensioned, elongate tensioning cylinder means including a cylinder and piston, one of said cylinder and piston

being carried by said accumulator cylinder means to be supported thereby, whereby longitudinal load applied to said tensioning cylinder means is transmitted to and places said accumulator cylinder means in longitudinal compression, the other of said cylinder and piston being connected to said



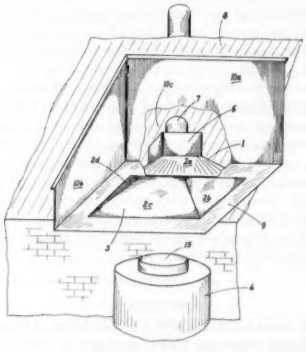
traveling block means for movement therewith, and means forming a passageway between said accumulator cylinder means and said tensioning cylinder means, whereby fluid displaced from said tensioning cylinder means by said piston is transferred to said accumulator cylinder means for biasing said traveling block to tension said line.

3,897,046

FUME HOOD

Daniel P. De Weese, Prospect, Ky., and Nicholas J. Brozenick, Clarksville, Ind., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Apr. 23, 1974, Ser. No. 463,293
Int. Cl.[2] F27D *17/00*
U.S. Cl. 266—16 **5 Claims**



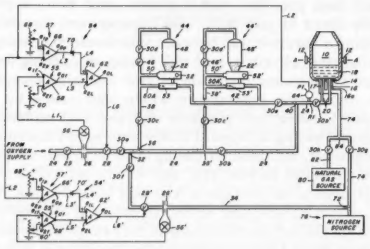
1. In combination with a furnace, a fume hood for exhausting gases and fumes escaping from said furnace comprising: a housing having a flow through inlet and a flow through outlet therein; a vertically extending baffle skirt surrounding and in fluid tight communication at its lower extremity with the outer periphery of said flow through inlet and in fluid tight communication at its upper extremity with a roof, said roof having an opening therein in fluid communication with said housing outlet with a fluid tight seal being disposed between said opening and said outlet whereby particulate matter entrained in circulating fumes which is not exhausted through said fume hood is prevented from circulating over and settling on said housing.

3,897,047

APPARATUS FOR AND METHOD OF REFINING AN IRON BASE MELT

William A. Kolb, Forest Hills Borough, and Jack F. Sigh, Crafton Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 275,848, July 27, 1972, abandoned. This application Nov. 24, 1972, Ser. No. 309,037
Int. Cl. C21c *5/48*
U.S. Cl. 266—35 **22 Claims**



1. Apparatus for refining an iron base melt by blowing a gas stream at a predetermined flow rate and containing a suspended particulate solid into said iron base melt through a tuyere located in a vessel containing said iron base melt and having a tuyere inlet, said apparatus having:

a. a gas supply source at super atmospheric pressure;

b. a main oxygen supply line connecting said gas supply source to said tuyere inlet for supplying said gas stream to said tuyere inlet at said predetermined flow rate for refining said iron base melt;

c. injection means for suspending said suspended particulate solid in said gas stream and for injecting said suspended particulate solid at a particulate injection point in said main oxygen supply line prior to entry of said gas stream and said suspended particulate solid into said tuyere inlet thereby increasing said pressure drop of said gas stream from said gas supply source to said tuyere inlet as a result of the passage of said gas stream and said suspended particulate solid through said injection means and said main oxygen supply line;

d. flow control means connected to said main oxygen supply line prior to said particulate injection point for sensing the flow of said gas stream through said main oxygen supply line;

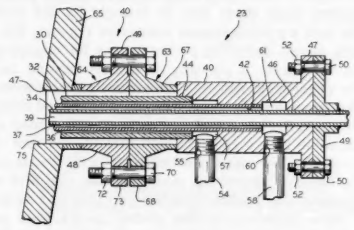
e. valve means connected to said flow control means and in communication with said main oxygen supply line prior to said particulate injection point for controlling the flow of said gas stream through said main oxygen supply line; and

f. said flow control means being operable to adjust said valve means in said main oxygen supply line to maintain substantially constant said predetermined flow rate of said gas stream and said suspended particulate solid to said tuyere inlet.

3,897,048
METALLURGICAL VESSEL AND METHOD OF OPERATING SAME

Jai K. Pearce; Eberhard G. Schempp, both of Pittsburgh, and Walter Sieckman, Bridgeville, all of Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed June 15, 1973, Ser. No. 370,547
Int. Cl. C21c 5/48
U.S. Cl. 266—35 6 Claims



1. A metallurgical vessel constructed and arranged to receive a metallic charge,

a tuyere assembly including first means defining a first tuyere passage for delivering oxygen to the interior of said vessel and beneath the level of said charge,

second means for defining a second tuyere passage in surrounding relation to the first tuyere passage for providing a hydrocarbon shielding fluid around the oxygen, third means for subdividing the first tuyere passage into a pair of tuyere passages to permit an increase in the quantity of shielding gas provided to the tuyere for preheating a metal charge in the vessel,

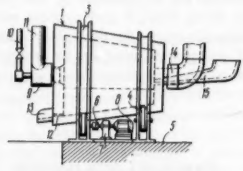
a source of hydrocarbon fluid and a source of oxygen,

first valve means for selectively coupling said oxygen source to one of said pair of tuyere passages and said hydrocarbon fluid source to said second tuyere passage and second valve means for selectively coupling one of said sources to the other of said pair of tuyere passages.

3,897,049
MIXER FOR METAL SUPERHEATING

Anatoly Alexeevich Cherny, ulitsa Slavy, 7, kv. 40; Vladimir Alexandrovich Grachev, ulitsa Odesskaya 6, kv. 54; Evgeny Mikhailovich Kirin, ulitsa Suvorova, 166, kv. 9; Nikolai Andreevich Gorelov, Ulyanovskaya 8, kv. 65, all of Penza, and Nikolai Vasilievich Boriskin, ulitsa Gorodok 114, Penzenskaya oblast, Bessonovka, all of U.S.S.R.

Filed Mar. 21, 1974, Ser. No. 453,371
Claims priority, application U.S.S.R., Mar. 27, 1973, 1899192
Int. Cl. F27b 7/16
U.S. Cl. 266—39 1 Claim

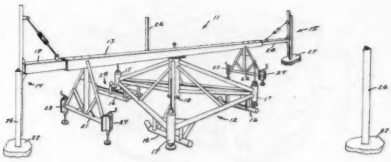


1. A mixer for metal superheating, which comprises; a casing in the form of a truncated cone, arranged horizontally with the capability of rotation around its axis; a refractory lining arranged inside said casing; a gas burner mounted on said casing on the side of the larger base of said truncated cone; a discharge spout for discharging metal, mounted on said casing on the side of the larger base; an exhaust pipe for evacuating combustion products, mounted on said casing from the side of the smaller base of said truncated cone; a feeding chute for feeding molten metal, mounted on said casing on the side of the smaller base; radially inwardly extending spaced lugs of a rectangular section, axially extending within said casing along its circumference and adjoining said lining, said lugs having a height of about 0.1 to 0.3 of the average diameter of said lining; channels formed by the spaces between said lugs and the inner surface of said lining; and a ring channel provided in said casing lining on its portion adjoining the larger base of the casing and combining said channels.

3,897,050
STUB SETTING FIXTURE

Richard E. Maloblocki, 103 Burr Ridge Club Dr., Burr Ridge, Ill. 60521

Filed July 20, 1973, Ser. No. 380,994
Int. Cl. B25b 11/02
U.S. Cl. 269—17 4 Claims



1. In a stub setting fixture, the combination comprising:

a frame, said frame provided with an alignment arm support pedestal extending upwardly therefrom;

a horizontally extending alignment arm rotatably mounted on said support pedestal, said alignment arm adapted to rotate in a horizontal plane upon said support pedestal;

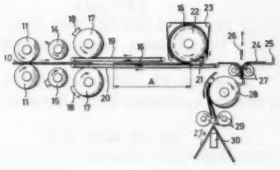
a cross-support assembly provided proximate to each end of said alignment arm, said cross-support assembly provided with a support leveling jack at each end thereof; and

stub member retaining means positioned at each end of said alignment arm, each of said stub member retaining means adapted to alignably position and retain a stub member in its end use position at an erection site.

3,897,051
METHOD AND APPARATUS FOR MAKING STACKS OF PRINTED SHEETS FOR A BOOKBINDING MACHINE

Hans Müller, Zofingen, Switzerland, assignor to Grapha Maschinenfabrik Hans Muller AG, Zofingen, Switzerland

Filed Mar. 8, 1972, Ser. No. 232,824
Claims priority, application Switzerland, Mar. 10, 1971, 3490/71
Int. Cl.[2] B41L 43/10
U.S. Cl. 270—43 9 Claims



9. Apparatus for continuously transforming a plurality of bands into bound booklets, comprising means for transporting said bands in the longitudinal direction thereof and at a first

speed; means for cutting successive leading portions of said bands at predetermined equal distances to form sheets; means for transporting each cutoff sheet in said direction and at a second higher speed so that each cut-off sheet separates from the following leading portion of said bands; means for stacking successive cut-off sheets for forming a stack; means for folding each stack along a fold line normal to said direction at which said bands and said sheets are transported so that a booklet is formed; means for opening said folded booklets; and means for transporting said opened folded booklets in the direction of said fold line and in a position for being bound along said fold line by a book binding machine.

3,897,052

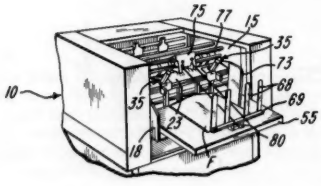
APPARATUS FOR STACKING BUSINESS FORMS

McKinley B. Turman, Dayton, and Gerald D. Hall, West Carrollton, both of Ohio, assignors to The Standard Register Company, Dayton, Ohio

Filed Sept. 4, 1973, Ser. No. 394,055

Int. Cl. B65h *29/26*; **B26f** *3/00*; **B65h** *29/52*

U.S. Cl. 271—188 **7 Claims**



1. In apparatus for bursting a continuous succession of business forms and including a set of upper and lower burst rolls, an improved device for stacking the individual business forms being fed from said burst rolls in a successive manner along a generally horizontal path, said device comprising a set of elongated form curving members spaced from said burst rolls across said path of the forms and having longitudinally extending opposing curving surfaces, means supporting said curving members for independent lateral adjustment and in a position with said opposing curving surfaces sloping upwardly and forwardly relative to said path and on opposite sides of the path for engaging the corresponding opposite marginal edges of each form, the spacing between said opposing curving surfaces being less than the width of the forms, means forming a set of ramp surfaces extending to said curving members and adapted to guide the corresponding edges of each form to said curving surfaces, said ramp surfaces and said curving surfaces cooperating to produce upward curving of the marginal edge portions of each form as the form travels along the path, a generally horizontal platform positioned forwardly and below said curving members for supporting a generally vertical stack of forms, and means for guiding each form with upwardly curving marginal edge portions into a stack on said platform.

3,897,053

SHEET FEEDING APPARATUS AND METHOD

George Victor Guy, London, England, assignor to Metal Box Limited, Reading, England

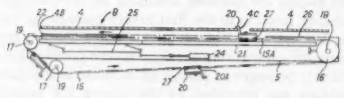
Filed Apr. 25, 1973, Ser. No. 354,343

Claims priority, application United Kingdom, Apr. 25, 1972, 19158/72

Int. Cl. B65h *9/10*

U.S. Cl. 271—238 **6 Claims**

1. Apparatus for feeding a succession of sheets of rigid or semirigid material to associated sheet-receiving equipment in predetermined orientation and alignment, said apparatus comprising a conveyor which comprises a main frame; sheet advancing means disposed longitudinally on said main frame for moving a succession of said sheets along a path on the conveyor in predetermined orientation; at least one pair of side lays, each side lay being disposed transversely opposite the other side lay of the same pair with the sheet advancing means disposed intermediately between the side lays of each pair; means, carrying said side lays and mounted on said main frame, for advancing the side lays along the conveyor simultaneously with said sheet advancing means; and side lay guide means carried on said main frame for gradually converging the appropriate side lays towards and into engagement with opposite side edges of each sheet when the side lays are so advancing, whereby each sheet may be brought by the side lays gradually into a predetermined transverse register, the sheet advancing means including pusher means for engaging rear edges of the sheets, a plurality of endless flexible carrying members engageable with the undersides of the sheets, first means for advancing the pusher means, and second means for advancing said flexible carrying members, said second means being movable at a speed less than that of said first means whereby the flexible carrying members urge the sheets continuously backwards against the pusher means, said first means for advancing the pusher means comprising a plurality of flexible drive members of the pusher means, said pusher means also comprising pusher dogs carried by said flexible drive members and arranged to engage the rear edges of said sheets, said apparatus comprising tension-adjusting means mounted on the main frame for adjusting the tension in the



said flexible drive members during operation, the flexible drive members being endless and arranged to define a longitudinal top run thereof supported from below by longitudinal guides, the said tension-adjusting means comprising a movable said guide extending along at least part of the length of said top run of each flexible drive member, and actuating means for moving said movable guides into and out of frictional engagement with the pusher means of said flexible drive members so as to control the tension in said flexible drive members.

2. Apparatus for feeding a succession of sheets to associated sheet receiving apparatus, said apparatus comprising sheet advancing means for advancing sheets along a sheet path, said sheet advancing means including a flexible drive member and a plurality of pusher members for engaging rear edges of sheets, connecting means connecting said pusher members to said flexible drive member at spaced intervals for movement along a predetermined path a portion of which generally corresponds to a portion of the sheet path, said connecting means being of the pivotal mounting type and mounting said pusher members for pivotal movement generally normal to the sheet path, guide means underlying a part of said predetermined path portion for engagement by said pusher members to control the tilting thereof and support means resistingly supporting said guide means for limited movement in response to pivoting of said pusher members in response to the resistance of a pushed sheet engaging sheet receiving apparatus to absorb the shock thereof.

3,897,054

CAROUSEL MECHANISM

Barton A. Riggs, 6018 Drexel Rd., Philadelphia, Pa. 19131

Filed Jan. 30, 1974, Ser. No. 437,895

Int. Cl. A63h *13/20*

U.S. Cl. 272—31 R **15 Claims**

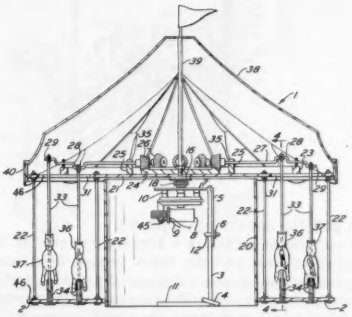
1. A carousel mechanism for concurrently rotationally displacing a plurality of figurines about a circuitous path in a

horizontal plane and reciprocally in a vertical direction, comprising:

a. a support base member positionally located central said carousel mechanism;

b. drive means secured to an upper section of said support base member for rotationally actuating a drive gear member;

c. a driven gear member rotationally moveable with respect to and mounted on a vertical shaft secured to said upper section of said support base member, said driven gear being mated with said drive gear;



d. a chassis having an upper and lower disk connected each to the other by column members and having said figurines secured thereto on vertically reciprocating rods;

e. friction coupling means between said driven gear and said upper disk of said chassis for support of said chassis; and,

f. bellcrank members rotatably secured to the upper surface of the upper disk of said chassis each having a bevel gear on a first end for mating with a stationary ring gear fixed on said vertical shaft above the upper surface of said chassis upper disk, said bellcranks connected on their second ends to said vertically reciprocating rods for reciprocally displacing said figurines in said vertical direction when said chassis is rotationally actuated by said drive means.

3,897,055

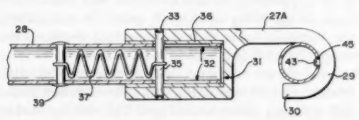
ADJUSTABLE CLIMBING APPARATUS

Douglas Caldow, 3108 Carlsen St., Berkeley, Calif. 94602

Filed Mar. 1, 1974, Ser. No. 447,317

Int. Cl. A63b *9/00*

U.S. Cl. 272—60 R **13 Claims**



1. An adjustable climbing apparatus for children comprising a rigid frame having a plurality of vertical support posts and a series of horizontal stationary bar members interconnecting said vertical support posts, and

a plurality of adjustable bar members of different lengths positionable between and releasably connectable to said stationary bar members, or other of said adjustable bar members, or one stationary bar member and one adjustable bar member, whereby different combinations of play structures can be assembled by suitably arranging said adjustable bar members within the rigid frame, each of said adjustable bar members having a gripping means disposed at each end thereof, said gripping means having a curved end portion at the outwardly projecting end thereof, the inner surface of which conforms to the outer surface of the bar member to which it is connected, said curved portion being formed to surround the bar member to which it is connected in such a manner that vertical forces applied to the adjustable bar member will not cause the connections to disengage, and at least one of said gripping means being secured in telescoping relation with respect to the end of the bar portion of said adjustable bar member and being spring loaded for biasing in a foreshortened position whereby, when said spring loaded gripping means is axially extended by overcoming the tension of the spring loading, said adjustable bar member can be connected in captured relation between any suitably positioned bar members.

3,897,056

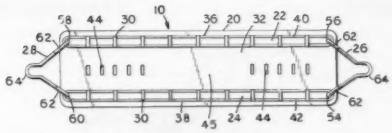
SAFETY STRAP SWING SEAT

Donal D. Hock, Herrin; Raymond J. Douglas, and William R. Baynes, both of Du Quoin, all of Ill., assignors to Turco Manufacturing Company, Du Quoin, Ill.

Filed Oct. 16, 1973, Ser. No. 406,894

Int. Cl. A63g *9/00*

U.S. Cl. 272—85 **8 Claims**



1. A safety strap swing seat comprising a flexible rectangular seat portion made of a flexible molded plastic, at least one resilient and bendable spring steel reinforcing strap formed separately from said seat portion and disposed parallel to the longitudinal edges of said flexible rectangular seat portion, attachment means for attaching said reinforcing strap to said flexible rectangular seat portion with said strap extending flat against the lowermost surface of said seat portion and in a plane parallel thereto, said strap being bendable with said seat portion under the weight of a person, and hanger means disposed along transverse edges of said flexible rectangular seat portion for the purpose of attaching said safety strap seat to supporting means.

3,897,057

TETHERED BALL BASEBALL PRACTICE DEVICE

Donald D. Pennington, 5340 E. 47th Pl., Tulsa, Okla. 74135

Filed Mar. 18, 1974, Ser. No. 451,895

Int. Cl. A63b *69/40*

U.S. Cl. 273—26 E **5 Claims**

1. A batting practice device for presenting a suspended ball to a batter comprising:

a supporting frame having three legs, one of which is detachably secured to the other two whereby, when one leg is detached, the frame may be compactly arranged for storing or shipping;

a shaft freely rotatably carried by said frame and extending vertically upwardly therefrom;

a tubular boom having a first end vertically pivotally affixed to the upper end of said shaft;

a cord extending through said tubular boom and secured at one end thereof to said boom first end, said cord extending out a second end of said boom, a ball being affixed to the outer end of said cord;

handle means secured to the lower end of said shaft for facilitating the rotation thereof; and

seating means supported to said tripodal frame and located rearwardly of said shaft whereby an operator seated thereon by rotating said handle rotates said boom to cause said ball affixed to said cord to rotate to present said ball through a large diameter arc to said batter.

3,897,058

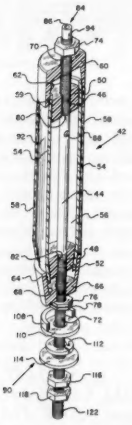
ATHLETIC TESTING DEVICE

Alvin F. Koch, 109 Oak Cir., Monroe, La. 71201

Filed Mar. 22, 1974, Ser. No. 453,791

Int. Cl.[2] A63B *69/36, 69/38, 69/00*

U.S. Cl. 273—26 B **25 Claims**



1. An athletic club handle for an athletic club which is normally used for playing a game requiring a controlled force application on the club handle by the users fingers and hand or hands as the club is swung, comprising:

a. a shaft positioned in the central portion of the handle;

b. an elongated pressure-responsive grip, surrounding and sealably mounted on said shaft and spaced apart from said shaft for a major portion of its length, said spaced apart grip forming a fluid receiving reservoir between said shaft and said grip, said reservoir being normally responsive to the controlled force exerted by the users fingers and hand pressure on the grip regardless of the position of the fingers along the length of the grip; and

c. means, associated with said reservoir and the exterior of the club handle, for forming a passageway from said reservoir to the exterior of the club handle.

3,897,059

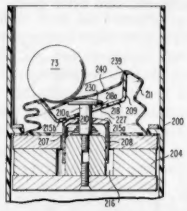
GOLF BALL PUTTING CUP

Robert P. McCulloch, 555 Perugia, Los Angeles, Calif. 90024, and Stephen H. Smith, 30526 LaVista Verde, San Pedro, Calif. 90732

Continuation of Ser. No. 186,289, Oct. 5, 1971, abandoned. This application Nov. 16, 1973, Ser. No. 416,448

Int. Cl. A63b *69/36, 57/00*

U.S. Cl. 273—34 A **3 Claims**



1. A golf cup apparatus comprising:

golf cup means including a housing operable to be positioned at least partially below ground level, and open upwardly and receive a downwardly moving golf ball;

generally concave, upwardly opening, ball impacting means positioned generally interiorly of said housing and including

base means extending generally transversely of a vertical axis of said golf cup, and

rim means extending upwardly from said base means and operable to exert laterally directed, ball restraining force on a golf ball disposed above said ball impacting means in force receiving cooperation therewith;

pivot means pivotally supporting said ball impacting means for random tilting movement relative to said golf cup axis; and

impact force applying means operable to transmit ball impacting force to said base means operable to tilt said ball impacting means about said pivot means, with said ball impacting force being operable to be transmitted through said ball impacting means to a golf ball which is laterally restrained by said rim means and disposed in force receiving cooperation with said ball impacting means;

said generally concave, ball impacting means being operable to

tilt downwardly on one side thereof in response to the weight of a golf ball acting thereon, with said rim means exerting a restraining force on said golf ball, causing it to be supported on said one side, and with said downward tilting being random in nature in accordance with the location on said ball impacting means where the weight of said golf ball is applied, and

tilt upwardly on said one side, in response to said transmission of said impacting force thereto, and impart golf ball ejecting force to said golf ball during said upward tilting directed upwardly and transversely of said golf cup means.

3,897,060

FOOTBALL BLOCKING APPARATUS

Ralph Earnest Jennings, 227 Newton, Glen Ellyn, Ill. 60137

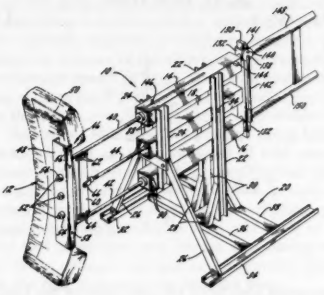
Filed Jan. 12, 1973, Ser. No. 323,291

Int. Cl. A63b *67/00*

U.S. Cl. 273—55 R **8 Claims**

1. A football blocking apparatus comprising, in combination, a base for supporting the apparatus, a plurality of horizontally extending tubes mounted above said base, a rod slidably mounted for axial movement within each of said tubes and having a forward portion which extends beyond each tube, a pad supporting assembly connected to the forward

ends of said rods coil spring means located within at least one of said tubes for providing resistance to the backward movement of said rods under a force applied to said pad supporting member and for urging said rods in the forward direction on removal of the applied force, means for synchronizing the axial movement of said rods within said tubes in a substantially linear fashion, shock absorbing means located within at least one of said tubes for damping the movement of said rods in the

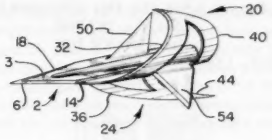


forward direction after removal of the applied force, and manually releasable locking means for holding said rods in a position of maximum backward movement achieved in response to a given force applied to said pad supporting assembly, said locking means including a vertical shaft having a blade detent for engaging a serrated portion of at least one of said rods, said shaft being engaged and released from said rod upon vertical movement relative to said rods.

3,897,061
VARIABLE FORCE PROJECTOR AND CATCHER
Donald J. Grattan, 3430 N. Elaine, Chicago, Ill. 60657
Filed June 11, 1973, Ser. No. 369,105
Int. Cl. A63b *71/02*
U.S. Cl. 273—96 R **8 Claims**

1. A toy projectile shooter comprising:
an elongated tubular barrel having a projectile-receiving muzzle end and a breech end; a projectile;
said muzzle end being flared and defining an open-ended cup larger than said projectile and includes:
a series of circumferential spaced flexible members extending radially inward from the wall thereof;
the axial distance of said flexible members from said muzzle end of said barrel being substantially equal to the diameter of said projectile and the length of said flexible members in relation to the diameter of said walled cup being such that said projectile passes therethrough with said flexible members retaining said projectile in spaced relationship aligned with said plunger rod by tangential contact with said projectile;
a trigger assembly at said breech end;
a spring-loaded plunger rod reciprocatably mounted within said tubular barrel;
one end of said plunger rod being forcefully extendable through said muzzle end of said barrel;
the other end of said plunger rod extending in operable relationship with said trigger assembly and having a handle end extending beyond said breech;
stop means at each end of said barrel to contain said spring-loaded plunger rod therein;
longitudinally spaced catch means along said plunger rod and each being registerable with said trigger mechanism at selected cocked positions of bias of said spring-loaded plunger rod;
means along said tubular barrel to indicate said selected biased positions of said plunger rod therein whereby the force applied to a projectile contained in said muzzle end is controlled upon release of said trigger assembly;
a gravity-sensitive member carried by said tubular barrel;
means connected to said gravity-sensitive member to indicate the longitudinal angular elevation of said barrel;
said trigger assembly includes a detent extending radially into said tubular barrel for registry with said catch means on said plunger rod to hold said plunger rod at selected positions of bias; and
means to move said detent circumferentially independent of said plunger rod to and from said positions of registry.

3,897,062
ARROWHEAD
Lawrence B. Christensen, 1222 E. 3rd South, Bountiful, Utah 84010
Filed June 6, 1974, Ser. No. 476,793
Int. Cl. F41b *5/02*
U.S. Cl. 273—106.5 B **7 Claims**

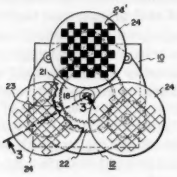


1. An arrowhead comprising
a longitudinal body section, a front end of which is formed into a point and a rear end of which is formed to define a socket for receiving an arrow shaft,
a pair of arcuate blades extending from either side of said body section and each curving up and over a different one of the faces of said section in a generally semicircular fashion, each of said blades having a sharp leading edge and a trailing edge, said leading edge extending from a corresponding side of said body section upwardly and away from the pointed end to join the trailing edge, and said trailing edge extending to and joining the rear end of said body section, and
a pair of second blades, each cut from a different one of said arcuate blades to extend from a different side of said body section in a direction generally opposite the direction of extension of the arcuate blade from which it is cut.

3,897,063
GAME BOARD APPARATUS
Heinz E. Lehwalder, 1792 Emigration Canyon, Salt Lake City, Utah 84104
Filed Mar. 18, 1974, Ser. No. 452,198
Int. Cl. A63f *3/02*
U.S. Cl. 273—131 B **4 Claims**

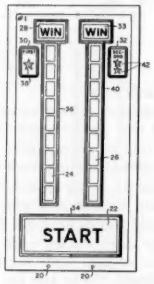
3. Game board apparatus including, in combination, a horizontal support member having a central, fixed, upstanding post, a revolvable support plate horizontally disposed above said support member and centrally journaled about said post, said support plate having a pre-determined pattern of shaft-receiving apertures, horizontal bull gear means centrally keyingly affixed to said upstanding post above said support plate, plural playing boards having fixed depending shafts respectively disposed in said apertures and respective, horizontal, planetary gears centrally fixed to and keyed with said shafts and meshing with said bull gear means, said playing boards thereby being revolvable with respective ones of said plane-

tary gears as said support plate carrying said planetary gear shafts is rotated about said post, and wherein said bull gear means comprises a small upper sun gear and a larger lower sun



gear, said shaft-receiving apertures being positioned such that said planetary gears will mesh with a selected one of said sun gears.

3,897,064
CHILDREN'S BOARD GAME APPARATUS
Nancy L. Sonnabend, 24 Greenhill Rd., Brookline, Mass. 02146
Division of Ser. No. 119,674, March 1, 1971, Pat. No. 3,714,722, which is a continuation of Ser. No. 707,681, Feb. 23, 1968, Pat. No. 3,566,484. This application Sept. 11, 1972, Ser. No. 287,760
Int. Cl. A63f *3/00*
U.S. Cl. 273—134 AD **10 Claims**



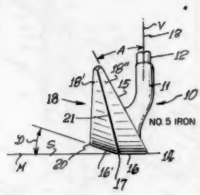
1. Game apparatus having incrementally movable playing pieces and having a playing surface bearing segmented path means along which play proceeds by means of said playing pieces, said apparatus providing each of at least two players with a uniquely-identified portion of a playing surface along said path means in accordance with the relative order in which the players take their turns, and further comprising

A. first and second identifying indicia marked along said path means for distinguishing, respectively, first and second side-by-side portions of said path means, said portions being of equal segment length on said path means,

B. first and second start pieces, each of which has a configuration different from that of said playing pieces, said first and second start pieces being identifyingly marked respectively with said first and second identifying indicia, and the first of which carries further indicia identifying a unity value and the second of which carries further indicia identifying a second number value, and

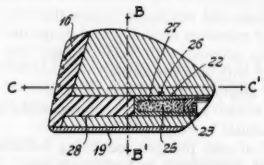
C. first and second start piece locations on said playing surface, each location being associated with and disposed proximal to the same-numbered path portion and being configured to have placed thereon the same-numbered start piece, so that upon selection of a start piece and placement of that start piece on the same-numbered location by a player, that player is thereby assigned an order of play and a path portion for use in playing games with said game apparatus.

3,897,065
GOLF CLUB HEAD WITH IMPROVED SOLE AND TOE PORTIONS
Karsten Solheim, 10412 N. 37th St., Phoenix, Ariz. 85028
Filed Jan. 31, 1974, Ser. No. 438,281
Int. Cl. A63b *53/04*
U.S. Cl. 273—167 A **1 Claim**



1. An improved club head for golf clubs of the type commonly referred to as irons used for hitting a ball into an airborne trajectory from a fairway comprising a metal blade having a striking face between a toe and heel, and having a hosel to receive a shaft at said heel, and a relatively wide sole between said toe and heel, said sole connecting with said striking face at a leading edge, a trailing portion of said sole most remote from said leading edge being beveled rearwardly relative to said striking face and upwardly relative to a horizontal plane, said horizontal plane passing through the central portion of said leading edge in a position normal to a vertical plane, said vertical plane passing through the axis of said shaft in a position parallel to said central portion of said leading edge, said sole bevel leaving a ridge extending from said heel to said toe, said club head having a trailing surface portion of said toe most remote from said striking face beveled rearwardly relative to said striking face and inwardly relative to a plane tangent to said toe and normal to said vertical plane, and wherein a surface portion of said toe between said trailing surface portion thereof and said striking face is beveled forwardly relative to said trailing surface portion and inwardly relative to said plane tangent to said toe to leave a toe ridge, said toe ridge blending in with said sole ridge, said toe ridge being located on said toe approximately midway between leading and trailing edges thereof and said sole ridge being located on said sole at least half way from said leading edge of said sole to a trailing edge of said sole.

3,897,066
GOLF CLUB HEADS AND PROCESS
Peter A. Belmont, 7 White Birch Ridge, Weston, Conn. 06608
Filed Nov. 28, 1973, Ser. No. 419,797
Int. Cl. A63b *53/08*
U.S. Cl. 273—171 **6 Claims**



1. Wooden head for a golf club comprising a wooden body having a core comprising its center of gravity, heel and toe sections on opposite sides of said core and separated by a

central vertical axis plane which intersects said core, face and rear sections on opposite sides of said core and separated by a transverse vertical axis plane which intersects said core at an angle perpendicular to said central axis, sole and upper sections below and above said core and separated by a horizontal axis plane which intersects said core, and at least two hollow tubular openings in said wooden body extending from the surface of said face section to the surface of said rear section, each of said hollow tubular openings having cemented therein adjacent the surface of the rear section a self-contained capsule comprising a hollow tubular walled element adapted to contain variable amounts of weight material for purposes of adjusting the balance of the club head, the remaining portions of said tubular openings being filled with plastic material, the interior wall of each capsule being threaded for engagement with a threaded cover forming the closure means therefor, an equal number of said tubular openings being located within said wooden body on opposite sides of said central vertical axis plane in said heel and toe sections, behind said core and behind said transverse vertical axis plane in said rear section and beneath said core and horizontal axis plane, said tubular openings extending parallel to each other and to the central vertical and horizontal axis planes and having the closure means of the capsules exposed and removable through openings in the rear surface of the wooden body.

3. Process for producing a wooden head for a golf club comprising a wooden body having a core comprising its center of gravity, heel and toe sections on opposite sides of said core and separated by a central vertical axis plane which intersects said core, face and rear sections on opposite sides of said core and separated by a transverse vertical axis plane which intersects said core at an angle perpendicular to said central axis, sole and upper sections below and above said core and separated by a horizontal axis plane which intersects said core, comprising the steps of boring an equal number of hollow tubular openings through said wooden body extending from said face section to said rear section in each of the heel and toe sections of said wooden body, on opposite sides of said vertical axis plane, beneath said core and horizontal axis plane and parallel to each other and to the central vertical and horizontal axis planes of said wooden body, inserting self-contained tubular walled elements into said tubular openings comprising capsules and securing said capsules at the rear sections of said openings behind said core and behind said vertical axis plane, said capsules being adapted to receive variable amounts of weight material and provided with closure means which are exposed and removable through openings in the rear surface of the wooden body, and filling the remaining portions of said tubular openings with a plastic material.

3,897,067

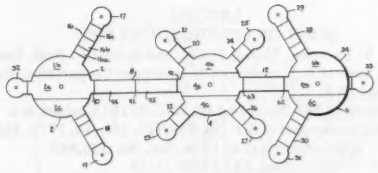
PORTABLE GOLF COURSE

Alvin H. Smith, 8940 Eastwood Rd., Pittsburgh, Pa. 15235

Filed June 13, 1974, Ser. No. 479,108

Int. Cl. A63b *67/02*

U.S. Cl. 273—176 G **17 Claims**



1. A portable golf course comprising a tee, at least three separate fairways, means for detachably connecting one end of each of said fairways to said tee, a plurality of greens each having a hole adapted to receive a golf ball and means for detachably connecting one of said plurality of greens to the other end of each of said fairways.

3,897,068

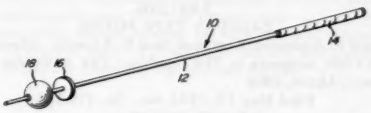
GOLF SWING TRAINING DEVICE

William N. Staples, 2 Howard Ct., Newport News, Va. 23601

Filed Aug. 16, 1974, Ser. No. 498,244

Int. Cl. A63b *69/36*

U.S. Cl. 273—186 A **2 Claims**



1. A straight elongated shaft having a handgrip on one first end portion thereof, the second end portion of said shaft being cylindrical, tapering toward the terminal end thereof and free of enlargements throughout at least a predetermined length thereof, a generally spherical weight member having a substantially constant diameter cylindrical passage formed therethrough on a diameter of said weight member and of a size to snugly receive said tapering second end portion therethrough with a larger diameter portion of said tapered second end portion lightly frictionally seated in the end of said passage remote from the terminal end of said second end portion, the length, weight and lengthwise balance of said shaft, with said weight member thereon, closely approximating the length, weight and lengthwise balance of a conventional golf driving club, said weight member being lightly frictionally retained in position on said tapered second end portion at a point spaced a predetermined distance from the terminal end thereof, but being freely slidable thereon upon slight shifting of said weight member toward the terminal end of said second end portion.

3,897,069

DEVICE FOR REMOVING DUST FROM A GRAMOPHONE RECORD

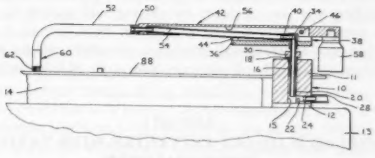
Michael Adrain Lee, Loenoweth, Feock, Truro, Cornwall, England

Filed Apr. 4, 1974, Ser. No. 457,792

Claims priority, application United Kingdom, Apr. 19, 1973, 18897/73

Int. Cl. G11b *3/58*

U.S. Cl. 274—47 **8 Claims**



1. A device independent of a tone arm for removing the dust from a gramophone record during the playing thereof, said device comprising a support means adapted to have its bottom removably attached to a reproduction apparatus for the record, a downwardly directed dust pick-up nozzle, a brush mounted on the end of said nozzle, which brush is arranged to bear in operation against the upper surface of the record to support the nozzle, means for creating a vacuum, air duct means extending from said pick-up mozzle into and through said support means and thence from above the bottom of the support means to the vacuum creating means so as not to interfere with the removable attachment of the device to the reproduction apparatus, said air duct means being mounted on said support means in such a manner as to permit movement of said pick-up nozzle across the upper surface of the record while the nozzle is being supported by the brush, and the fibres of said brush being of such cross-section that in

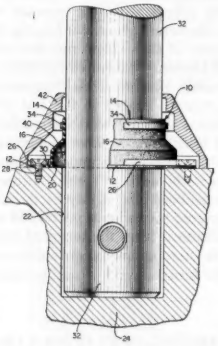
operation of said device the tips thereof engage in the groove of the upper surface of the record and thereby bring about tracking movement of said pick-up nozzle across the record as the record is played, said vacuum creating means serving during such tracking movement to suck dust from said surface of the record via said air duct means.

3,897,070

BANBURY TYPE MIXER

Gerald E. Anderson, Kent, and Paul R. Kennedy, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 17, 1974, Ser. No. 470,785
Int. Cl. F16j *15/16*
U.S. Cl. 277—1 **12 Claims**



1. The method of improving service time availability of a Banbury-type mixer for processing rubber compounds and the like by mixing dry powders thereinto, which mixer comprises a ram-weight ram and a ram-weight having a socket receiving an end of said ram, said ram-weight being connected to said ram by means providing limited relative movement of the weight with respect to the ram, said method comprising filling said socket about said ram with a suitable fill of lubricant, and excluding said dry powders by closing said socket to retain said lubricant therein with an annular boot having a highly flexible heat-resistant wall extending circumferentially around said ram and axially of said ram outwardly of said socket.

3,897,071

ANNULAR BLOWOUT PREVENTER WITH VARIABLE INSIDE DIAMETER

Robert K. Le Rouax, Houston, Tex., assignor to Hydril Company

Continuation-in-part of Ser. No. 248,119, April 27, 1972, abandoned. This application Nov. 16, 1973, Ser. No. 416,584
Int. Cl. E21b *33/06*
U.S. Cl. 277—185 **14 Claims**

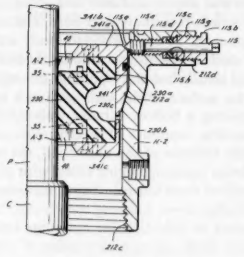
1. An annular blowout preventer, comprising:

an annular yieldable sealing means having an inner bore therethrough through which a well pipe or the like is adapted to extend;

a variable inner diameter upper anti-extrusion means disposed at the upper end of said yieldable sealing means; and

said anti-extrusion means including plural pipe engaging means with said sealing means and overlapping adjacent ones of said pipe engaging means;

said plural pipe engaging means being movable radially with said sealing means for providing a variable inner diameter thereof for engagement with the external surfaces of well pipes of varying diameters to prevent upward extrusion of



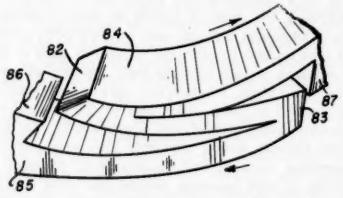
said sealing means at each of the varying diameters of the pipes.

3,897,072

SLIT RING WITH CONNECTING MEMBRANE

Egons Inka, Chicago, and Raymond O. Shurson, Niles, both of Ill., assignors to Crane Packing Company, Morton Grove, Ill.

Filed Feb. 12, 1973, Ser. No. 331,866
Int. Cl. F16j *9/00*
U.S. Cl. 277—215 **10 Claims**



1. An endless sealing ring of compliant material having a transversely disposed slit therein extending from one surface thereof toward and spaced from an oppositely disposed surface thereof and forming with said oppositely disposed surface a flexible membrane; at least a portion of said slit having a component of direction parallel to said oppositely disposed surface the portions of the ring adjacent said membrane being relatively movable to bend said membrane upon itself and thereby change the diameter of the ring, whereby to facilitate assembly of the ring into an annular groove.

3,897,073

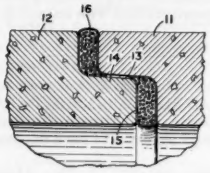
JOINT OF UNDERGROUND PIPE

Harold V. Swanson, Morris Plains, and Robert E. Bald, Roseland, both of N.J., assignors to Interpace Corporation, Parsippany, N.J.

Division of Ser. No. 414,144, Nov. 9, 1973, which is a continuation-in-part of Ser. No. 359,967, May 14, 1973. This application Nov. 4, 1974, Ser. No. 520,803
Int. Cl.² F16V *15/38*
U.S. Cl. 277—229 **13 Claims**

1. A joint between first and second continuous successive lengths of pipe made of a nonmetallic earthen material, wherein a bell formed on an end of the first length is engaged by a spigot formed on an end of a second length, the joint characterized by a distortable band of a cellular water invadable material impregnated with a dry hydratable cement which

is reactive with water to hydrate thereby forming a hard water impervious substance, the band positioned between the spigot



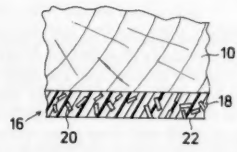
and the bell and engaged by said engagement of the spigot into the bell.

3,897,074

SKI WITH MICROPOROUS BOTTOM SURFACE

Antti-Jussi Tiitola, Tampere, Finland, assignor to Karhu-Titan oy, Helsinki, Finland

Filed Feb. 22, 1974, Ser. No. 444,876
Int. Cl. A63c *5/04*
U.S. Cl. 280—11.13 L **9 Claims**



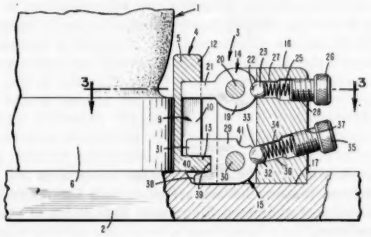
1. In a ski, an elongated narrow strip having one surface which is normally directed upwardly to be engaged by a ski boot and an opposed surface which is normally directed downwardly toward the ground, and a bottom layer fixed to said strip and engaging and covering said opposed surface thereof, said bottom layer being comprised for the most part of a plastic material in which short tubular fibers are embedded with random orientations, said tubular fibers having internal capillary passages and including at a surface of said bottom layer which is normally directed downwardly away from said strip a number of fibers which are flush with and have their passages exposed at said surface of said bottom layer to provide the latter surface with a microporous structure.

3,897,075

RELEASABLE BINDER

Robert C. Cutter, Box 1074, Glenwood Springs, Colo. 81601

Filed Nov. 7, 1972, Ser. No. 304,483
Int. Cl.² A63C *9/08*
U.S. Cl. 280—11.35 T **4 Claims**



1. A device for releasably binding a boot to a ski, comprising:

a projection engagement member secured to said boot;

a first cam means pivotally mounted on said ski and having an integral projection means thereon for engaging said engagement member and releasing said engagement after pivoting through a first angle;

a second cam means pivotally mounted on said ski and having a second integral projection means thereon for releasably engaging said engagement member after said releasing by said first cam means; and

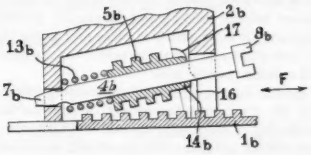
pressurizing means bearing on said first and second cam means and applying pressure to said first and second cam means for hindering the pivoting thereof.

3,897,076

LONGITUDINAL ADJUSTMENT DEVICE NOTABLY FOR SKI BINDINGS

Jean Joseph Alfred Beyl, 10, Blvd. Victor Hugo, 58 Nevers (Nievre), France

Filed Nov. 5, 1973, Ser. No. 412,658
Claims priority, application France, Nov. 20, 1972, 72.41180
Int. Cl.² A63C *9/22*
U.S. Cl. 280—11.35 T **8 Claims**



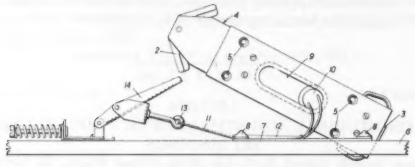
1. A ski binding comprising an adjustment section member means adapted to be fixedly mounted on a ski; a fastening element means for releasably retaining one end of a ski boot on the ski, said fastening element means being adapted to be mounted on the adjustment section member means, said fastening element means being relatively moveable along a selected direction with respect to said adjustment section member means; said fastening element means further comprising a bearing and an adjustment member means, said adjustment member means being carried by said fastening element means and mounted for free movement in said bearing; complementary fine adjustment means on said adjustment member means and on said adjustment section member means fo; permitting fine adjustment, in said selected direction, of the position of said fastening element means with respect to the adjustment section member means, said complementary fine adjustment means being disconnectable from each other to permit relative coarse adjustment of the relative positions of said fastening element means and said adjustment section member means, said adjustment member means being moveable between a first position in which said complementary fine adjustment means are operatively interconnected for permitting relative fine adjustment of the said fastening element means and said adjustment section member means, and a second position in which said complementary means are disconnected from each other and inoperative; and locking means releasably and firmly retaining the said adjustment member means in the first position and the second position.

3,897,077

SAFETY SKI BINDING HAVING CABLE HELD SOLE PLATE

Gottfried Schweizer, Vienna, Austria, assignor to Gertsch AG, Zug, Switzerland

Filed Jan. 25, 1974, Ser. No. 436,544
Claims priority, application Austria, Feb. 6, 1973, 1053/73
Int. Cl. A63c 9/08
U.S. Cl. 280—11.35 K 4 Claims



1. A safety ski binding arrangement for securing a ski boot to a ski, comprising:

a sole plate having means thereon for securing said ski boot thereto, said sole plate including guide means thereon;

carriage means reciprocably mounted in said guide means for movement in the plane defined by the sole plate;

releasable securing means for releasably securing said sole plate to said ski, said releasable securing means comprising nonelastic cable secured at one end to the underside of said carriage means, lever operated tensioning and release means secured to said ski, the opposite end of said cable being secured to said lever operated tensioning and release means, cable guide means for guiding said cable downwardly from said sole plate and in the plane between the sole plate and the ski to said lever operated tensioning and release means; and

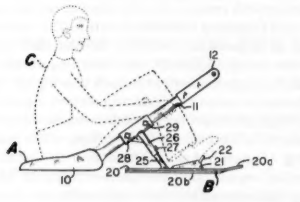
stop means for engaging and positioning said sole plate on said ski prior to a tensioning of said cable, whereby a tensioning of said cable by said lever operated tensioning and release means will tighten said cable and draw said sole plate into tight engagement with said stop means.

3,897,078

SKI SHOVEL

Dennis M. Melnick, RD 1, and Mark Kubick, Brookside Dr., both of Baden, Pa. 15005

Continuation of Ser. No. 248,034, April 27, 1972, abandoned. This application July 9, 1973, Ser. No. 377,417
Int. Cl. B62b 13/16
U.S. Cl. 280—15 19 Claims



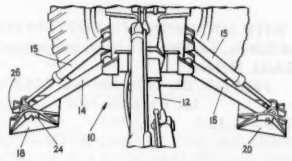
1. In a ski device employing a shovel having a relatively planar scoop part that is to serve as a seat for a rider and a rounded upwardly extending and inclined handle that is to serve as a hand-gripping means for the rider, a ski attachment for the shovel which comprises, a relatively narrow longitudinally forwardly extending ski runner part, an upwardly projecting cross-extending foot-receiving abutment part mounted in a secure relation on the upper side of said runner part adjacent its front end, a backwardly upwardly inclined arm secured on the upper side of said runner part in a backwardly spaced relation with respect to said abutment part and having a mount at its upper end adapted to fit over the handle of the shovel, and means cooperating with said mount for securing said arm on the handle and for positioning said runner part in a spaced-apart forward relation with respect to the scoop part of the shovel.

3,897,079

STABILIZER PAD FOR EARTHMOVING APPARATUS

Robert A. MacKenzie, 181 Morton St., Stoughton, Mass. 02072, and Andry Lagsdin, 63 Chard St., Weymouth, Mass. 02189

Filed Mar. 19, 1973, Ser. No. 342,684
Int. Cl. B60s 9/02
U.S. Cl. 280—150.5 19 Claims



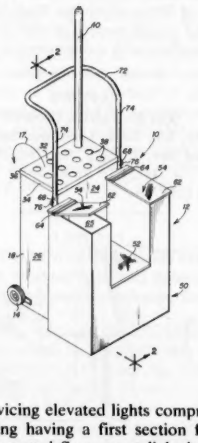
1. For an earthmoving apparatus having at least one support arm, a stabilizer comprising a plate-like piece having alternate surfaces one of which is resilient and the other of which includes a flanged web, and means pivotally supporting said piece to an end of said arm, one of said supporting means and said piece being provided with a cut-away section, said piece being revolvable through at least 180° relative to said support means between alternate positions wherein either said resilient surface is facing downwardly or said flanged web is engaging the ground.

3,897,080

ELECTRIC LIGHT CART

William C. Isom, 9430 Folkstone, Dallas, Tex. 75220

Filed Oct. 15, 1973, Ser. No. 406,478
Int. Cl. B62b 1/12
U.S. Cl. 280—47.19 11 Claims



1. A cart for servicing elevated lights comprising:

a wheeled housing having a first section for receiving a plurality of elongated fluorescent light bulbs in vertical positions,

said housing having a second section attached to a wall of said first section with upper and lower steps formed thereon, said lower step being located in the center of

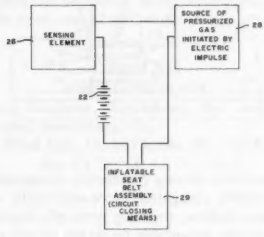
said second section and said upper steps being located on either side of said lower step.

3,897,081

VEHICLE SAFETY SYSTEM

Donald J. Lewis, Troy, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Nov. 29, 1972, Ser. No. 310,284
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **6 Claims**



1. A vehicle safety system comprising:
a. an inflatable seat belt assembly including a fastening device having a latched and an unlatched condition;
b. circuit means connected to said seat belt assembly;
c. circuit closing means for closing said circuit means in response to said latched condition of said fastening device;
d. a source of electrical power connected to said circuit means for supplying an electrical impulse;
e. a gas source connected to said circuit means for supplying pressurized gas through said fastening device to said inflatable seat belt assembly upon receipt of said electrical impulse; and
f. sensing means connected to said circuit means, responsive to collision of the vehicle and operating, with said circuit means closed, to transmit said electrical impulse to said gas source upon collision of said vehicle,
whereby said electrical impulse can only be transmitted to said gas source when said fastening device is in said latched condition.

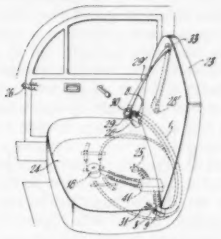
3,897,082

VEHICLE SAFETY BELT APPLYING MECHANISM

Takezo Takada, deceased, late of Tokyo, Japan, and by Juichiro Takada, legal authorized heir, Tokyo, Japan, assignors to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1973, Ser. No. 424,968
Claims priority, application Japan, Dec. 16, 1972, 47-125815
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 SB **9 Claims**

1. A mechanism for automatically applying restraint to the occupant of a seat, including a seat portion and a back portion comprising a first belt, first connecting means, including a spring biased belt retractor connecting said belt proximate a first side of said seat, a first coupling member located on said first belt proximate the free end thereof, a second coupling member releasably engageable with said first coupling member, second connecting means connecting said second coupling member proximate a second side of said seat opposite to said first side, a first arcuate transfer arm, first guide means supporting said first transfer arm for movement along the arcuate length of said first transfer arm between a retracted position with the distal end of said transfer arm proximate the rear of said seat portion first side and a position toward said seat second side, a first transfer member mounted on said first transfer arm distal end portion and engaging said first belt to advance the free end thereof with the advance of said first transfer arm and means for advancing said first transfer arm, including a drive wheel, a motor drive coupled to said drive wheel, a first elongated flexible member connected at a first end to the proximate end portion of said transfer arm and



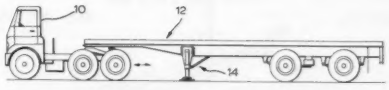
engaged and driven by said drive wheel, and guide means leading said elongated member from said drive wheel to said first transfer arm proximal end along a path through a point forward of said proximal end when said transfer arm is rearward of its advanced position.

3,897,083

SUPPORT LEG FOR A TRAILER BODY

Neil Pickering, 16 Lesbury Ave., Brampton, Canada

Filed Nov. 1, 1974, Ser. No. 519,937
Claims priority, application Canada, Mar. 13, 1974, 194903
Int. Cl.[2] B60S *9/02*
U.S. Cl. 280—150.5 **5 Claims**



1. A support leg construction for supporting a trailer body comprising
a support leg,
a shoe for said leg having longitudinally extending track means therein,
a foot on said support leg,
said foot engaging in said track means for forward movement therein as the forward end of the trailer supported by said leg in use moves forwardly, means for normally urging said foot towards the rearward end of said track means, said track means sloping downwardly from back to front of said shoe.

3,897,084

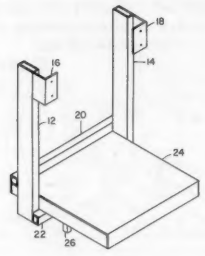
STAND-OUT

Robert C. Bergskoog, R.R. No. 2, Holdrege, Nebr. 68949

Filed Jan. 22, 1973, Ser. No. 315,177
Int. Cl. B60r *3/02*
U.S. Cl. 280—166 **8 Claims**

1. A truck box access apparatus adapted to be mounted along the inside of the lower sill of the truck comprising a pair of spaced parallel support members [**12, 14** means [**16, 18** at one end of each of said support members for mounting said apparatus along the inside of the lower sill, a first [**20** and a second [**22** cross bar disposed at the other end of each said support members, said first and said second cross bars extending between said support members and being spaced from each other, both longitudinally and transversely with respect to the longitudinal direction of the support members, a step platform [**24** slidably supported between said first and said second bars and between first and second extreme positions,

said step platform in its first extreme position extending outwardly from said support members and at a right angle thereto



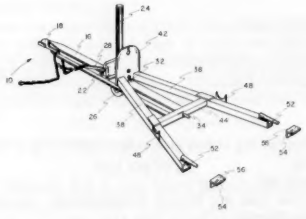
and said step platform in its second position being nested flush between said support members.

3,897,085

VEHICLE TOWING ASSEMBLY

Roy E. Hawkins, 6905 Falls of Neuse Rd., Raleigh, N.C.

Filed Oct. 22, 1974, Ser. No. 516,979
Int. Cl.² B62D *53/04*
U.S. Cl. 280—402 **10 Claims**



1. A vehicle towing assembly for interconnecting two vehicles one behind the other, said vehicle towing assembly comprising:

a. an elongated tongue adapted to attach to a front towing vehicle;

b. an A-frame vehicle support structure extending rearwardly from said tongue for engaging a rear towed vehicle and supporting the same while being towed by the front towing vehicle;

c. said A-frame vehicle support structure including a pair of rearwardly projecting legs having rear terminal ends that terminate in lateral spaced apart relationship relatively to each other;

d. a mounting pin fixed about the rear terminal end of each leg and projecting therefrom such that when said vehicle towing assembly is interconnected between vehicles each of said mounting pins project through an opening associated with a pin receiving structure fixed to the frame of the towed vehicle about the underside thereof;

e. cradle means disposed on said A-frame vehicle support structure and generally U-shaped for receiving the front axle of the towed vehicle; and

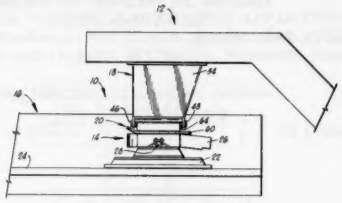
f. means for detachably securing said A-frame vehicle support structure to said tongue such that said tongue may be separated from said A-frame vehicle support structure for convenient transport or storage.

3,897,086

PIN BOX

Glenn H. Breford, Holyrood, Kans., assignor to Midway Industries, Inc., Holyrood, Kans.

Filed Sept. 10, 1973, Ser. No. 395,566
Int. Cl.² B62D *53/08*
U.S. Cl. 280—438 R **2 Claims**



1. A tractor-trailer towing connector, comprising:

a. an appreciably elongated, cross-sectionally rectangular, substantially hollow, normally vertically positioned upper member rigidly mountable on its upper end portion on a tongue portion of a trailer and extending downward from said tongue portion, said upper member having two opposed sides tapering inwardly from said upper end portion to said lower end portion, and being larger in cross-sectional area at the top than at the bottom,

b. said upper member having means to pivotally mount a hitch engaging member on the lower end portion thereof,

c. a hitch engaging member pivotally mounted on said means to mount same, said hitch engaging member having a shoe on an upper portion thereof, and a coupler pin riddily mounted on said shoe and depending therefrom, said hitch engaging member pivotable on an axis generally aligned with the longitudinal axis of said trailer, and

d. said means to mount has a yoke mounted on said lower end portion of said upper member, a shaft mounted in said yoke, a sleeve mounted on said shaft and brace members rigidly secured to said sleeve and rigidly secured to said hitch engaging member,

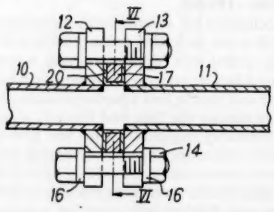
said connector is constructed and adapted to be mounted on a trailer tongue to connect it in towing relation to a tractor having a fifth wheel type hitch.

3,897,087

METHOD OF FASTENING APPARATUS ELEMENTS

David Neilson, Skelmorlie, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 13, 1973, Ser. No. 387,728
Claims priority, application United Kingdom, Sept. 1, 1972, 40674/72
Int. Cl.² F16L *35/00*
U.S. Cl. 285—18 **10 Claims**



5. A clamped joint comprising at least two apparatus elements each having slots with open ends disposed at an edge of the element, said elements being clamped and held in fixed relative positions by at least one fastening device which is

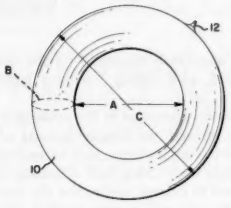
disposed in the slots in apparatus elements and which is separable from said apparatus elements through said open end of said slots and which applies clamping forces to said apparatus elements and which is held in its operative position with respect to said apparatus elements solely by said clamping forces, at least one metal element which is fusible below 150°C in said joint through which the clamping device transmits the clamping pressure required to hold said clamping device in its operative position relative to said apparatus elements, whereby upon subsequently heating and melting said fusible metal element the clamping pressure is relieved from said apparatus elements and from said clamping device so that the latter may be separated from said apparatus elements through said open end of said slots.

3,897,088

SEALING BOOT

Ernest Lloyd Beinhaur, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 12, 1973, Ser. No. 423,943
Int. Cl.[2] F16L *17/00, 33/16*
U.S. Cl. 285—97 **7 Claims**



1. A sealing boot for effecting an environmental tight seal on members, such as cables, conduits, and the like, said boot comprising:

a closed annular unit of inflatable material capable of withstanding low internal pressures, said unit in a normal, relaxed, deflated state having an inner diameter less than the external diameter of said members;

reinforcement means restricting the transverse cross-sectional inflation of said unit; and

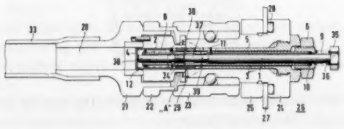
means to inflate and deflate said unit whereby said unit is initially inflated and subsequently deflated into sealing engagement with said member.

3,897,089

DEVICE FOR THE RELEASABLE CONNECTION OF A DUAL HOSE SYSTEM TO A CLOSED CONTAINER

Carl Hans Leichsenring, Graben-Neudorf, and Gustav Kunz, Bruchsal, both of Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Dec. 5, 1973, Ser. No. 421,995
Claims priority, application Germany, Dec. 5, 1972, 2259429
Int. Cl. F16l *39/02*
U.S. Cl. 285—158 **4 Claims**



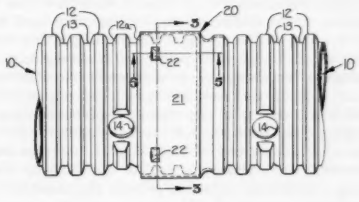
1. For use with a coupling for the releasable connection of a dual hose, composed of an inner hose inside an outer hose, to a closed container, the coupling defining an axially extending passage for such inner hose and being composed of an inner coupling part fastened to the outer hose of the dual hose system and an outer coupling part detachably connected to the inner part and fastened to the closed container, the two parts being connected together to meet along a separating plane, a two-part plug arranged to be inserted into the passage defined by the coupling in the direction from the container, said plug being composed of an inner part and an outer part, said inner and outer parts being separable from one another and meeting along a separating plane coincident with the separating plane of the coupling when said plug is fully inserted into the coupling, each said part of said plug comprising two members which are axially movable relative to one another and an annular seal of a resiliently deformable material, said seal having a pair of opposed axial end surfaces, each bearing against a respective one of said members, and an external circumferential surface arranged to face the surface of the coupling which defines the axially extending passage, with the end of one of said members and the associated end of said seal being arranged to lie on said separating plane when said plug is fully inserted and that portion of said one member against which the associated end surface of said seal bears having the form of an oblique surface sloping radially outwardly relative to the body of said seal, whereby relative movement of said two parts in a direction to move said axial end surfaces of said seal toward one another causes said seal to deform radially outwardly to form a sealing connection with the surface of the coupling which defines the axially extending passage.

3,897,090

CORRUGATED PLASTIC PIPE WITH INTEGRALLY FORMED COUPLER

Ernest J. Maroschak, Roseboro, N.C., assignor to Plastic Tubing, Inc., Roseboro, N.C.

Filed May 19, 1972, Ser. No. 254,934
Int. Cl.[2] F16L *31/00*
U.S. Cl. 285—260 **8 Claims**



1. An elongate corrugated resilient plastic drainage pipe having spaced-apart successive annular ribs with annular valley portions therebetween extending from adjacent one end portion of the pipe and throughout the remainder of the pipe, and coupling means integrally formed with said pipe and defining said one end portion thereof and adapted for releasable connection with the opposite end of another like pipe, said coupling means comprising an annular collar having an inner diameter greater than the outer diameter of said ribs and having an inwardly extending annular shoulder defining the inner end of the collar and serving as an abutment stop for a connecting pipe, said collar being of a length so as to receive therein at least one rib of a connecting pipe, a plurality of spaced latching members integrally formed with said collar and extending inwardly around the interior of said collar, the radial distance from the inner end of each latching member to the axis of the collar being less than the radius of said ribs, each of said latching members having at least a first pair of opposing uninterrupted walls integrally formed with said collar, one of said walls sloping inwardly away from the outer end of the collar and toward the axis of the collar and serving as a cam surface for facilitating interconnecting of pipes, and the opposing wall extending substantially normal to the axis of the

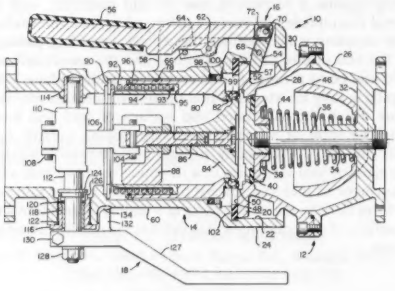
collar and adapted to engage the side of a rib of an interconnected pipe for resisting the releasement thereof.

3,897,091

DRY-BREAK COUPLER

Jack A. McMath, Ft. Thomas, Ky., and Charles W. Taylor, Batavia, Ohio, assignors to Dover Corporation, New York, N.Y.

Division of Ser. No. 261,094, June 8, 1972, abandoned. This application Sept. 14, 1973, Ser. No. 397,597
Int. Cl. F16l *37/20*
U.S. Cl. 285—311 **7 Claims**



1. In combination a dry-break coupler for use in a fluid system in which a coupler and an adapter are each connected to a fluid system and cooperate one with the other to form a dry-break coupling device, the coupler comprising a housing having a bore in the terminal end portion, an annular surface extending radially inward of said bore, said adapter having a terminal end portion adapted to be received within said bore in butting relation with said annular surface, at least a pair of handles, means double pivotally connecting each handle to said housing, said double pivot connecting means comprising a pair of stationary pivot points and a moveable pivot point positioned therebetween so that when the handles are in closed position the moveable pivot point is beyond a line extending between the two stationary pivot points to provide a locking effect on the handles, a clamping rigid pawl pivotally connected at one end of each handle, pivot means fixedly connecting each clamping pawl to said housing, each pawl having a contoured surface to provide clearance for receiving the terminal portion of said adapter and being cooperatively engageable with the terminal portion of the adapter to fasten the coupler and adapter together upon movement of each of said handles from an open to a closed position wherein each pawl is pivoted about said pivot means from a non-clamping condition to a clamping condition.

3,897,092

LEVER OPERATED DOOR LATCH OPENER

Norman C. Atkins, Franklin Park, Ill., assignor to The Citation Companies, Inc., Grand Rapids, Mich.

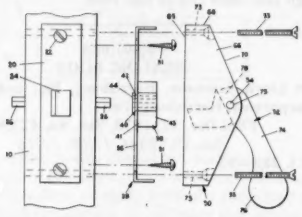
Filed Jan. 14, 1974, Ser. No. 433,355
Int. Cl. E05c *9/00*
U.S. Cl. 292—92 **4 Claims**

1. In a door latch mechanism, wherein a door latch is actuated by the rotation of a spindle extending out of a door, a lever operated door latch opener comprising:

a cam mechanism comprising:

a cam plate having a circular cam opening formed in the middle thereof, said cam plate being mounted as a separate unit against the door, with the cam opening fitting over the spindle; and

a cam rotatably attached to the cam plate for rotation about an axis perpendicular to the cam plate, said cam including a body that engages an outer side of the cam plate and a cylindrical collar extending from the body that fits through said cam opening, said cam including means on the inner side of the cam plate for holding the collar in the cam opening; said cam having an axial spindle opening formed therein that non-rotatably fits over the door latch spindle such that rotation of the cam rotates the door latch spindle, said cam further having a lever engaging arm having symmetrical upper and lower cam surfaces facing away from the lever engaging arm, said cam surfaces permitting engagement of the cam from the top or bottom of the cam;



a hollow casing separately mounted on the door over the cam mechanism, said casing having a handle opening therein; and

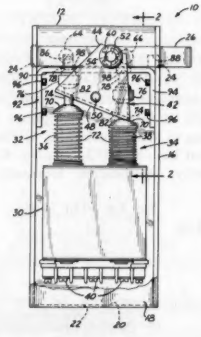
a lever arm pivotably mounted in the apparatus at an inner end extending through the handle opening of the casing, said lever arm having an outer end extending out of the casing, said inner end having cam actuating finger means thereon adapted to engage and rotate the one of the cam surfaces on the cam sufficiently to open the door latch when the lever arm is pivoted from a deactuated to an actuated position.

3,897,093

ELECTRICAL DOOR LOCK

Max Wiczer, Skokie; Vahram K. Sarrafian, Morton Grove, and Djordje R. Popovic, Chicago, all of Ill., assignors to Wico Corporation, Niles, Ill.

Filed May 9, 1974, Ser. No. 468,451
Int. Cl.[2] E05C *1/06*
U.S. Cl. 292—144 **10 Claims**



1. An electrically actuated mechanism for use in locking doors and the like, comprising:

a frame having side walls with at least one aperture therein for receiving a lockbolt;

a lockbolt mounted for reciprocal movement along a path and extending through at least one of said side wall apertures for cooperative interaction with a keeper plate or

the like, said lockbolt being movable between first and second positions along said path;

lever means having one end portion pivotally mounted to said frame, said lever means being connected to said lockbolt so that pivoting said lever means moves said lockbolt between first and second positions;

first and second electrically actuated solenoids, each having plungers engaging said lever means whereby actuation of one of said solenoid causes said lever means to move said lockbolt to said first position, and actuation of the other solenoid causing said lever means to move said lockbolt to said second position;

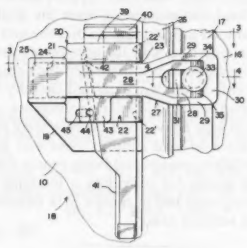
said lockbolt having at least one locking aperture adapted to receive the end portion of one of said solenoid plungers and thereby restrain said lockbolt from movement until said one solenoid is actuated.

3,897,094

LOCK ARRANGEMENT FOR BOX CAR DOORS

James J. Schuller, Crete, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Sept. 23, 1974, Ser. No. 508,500
Int. Cl.[2] E05C *19/08*
U.S. Cl. 292—283 **5 Claims**



1. In a railway car side having a door opening, a device for locking a sliding door in a closed position over said opening, comprising:

a keeper including a housing mounted on said side adjacent said door opening,

said housing having upper and lower vertically aligned open end wedge receiving chambers,

said portions being separated by a horizontal hasp receiving entry slot terminating at one end in a hasp cam receiving pocket and said slot being open at its other end, the improvement comprising:

a hasp including a relatively flat body terminating at one end in an enlarged cam having a tapering cam surface, said cam in the closed and locked position of said door being seated in said hasp cam receiving pocket with a portion of said hasp body being disposed in said entry slot,

a wedge locking pin seated within said chambers and including a bevel portion in said locked position engaging said tapering cam,

said wedge pin being adapted to be vertically forced into and out of seated relation with respect to said chambers,

said hasp body including at its other end a slot,

a connecting pin rigidly secured to said second door and projecting outwardly from said second door through said slot,

said pin having an enlarged head disposed outwardly over said slot and said slot permitting limited horizontal movement of said hasp relative to said pin,

said hasp having a flat surface adjacent said slot,

said surface terminating in ramp portion means, with said ramp portion means extending from said flat surface diagonally outwardly relative to vertical plane of said door whereby during horizontal movement of said hasp relative to said pin during wedging locking of said hasp by said wedge pin,

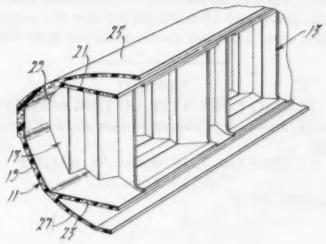
said head of said pin engages said inclined ramp portion means thereby forcing said hasp end adjacent said slot inwardly into substantially contiguous relation relative to said door.

3,897,095

RESILIENT BUMPER ASSEMBLY

Patrick M. Glance, Plymouth, and Marvin A. Maten, Jr., Orchard Lake, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 7, 1973, Ser. No. 422,946
Int. Cl.[2] B60R *19/10*
U.S. Cl. 293—71 P **3 Claims**



1. A resilient bumper assembly for an automotive vehicle including:

a rigid elongate backing member extending transversely of the vehicle,

an elastomeric outer shell,

means securing said outer shell to said backing member,

energy absorbing means fully received within the outer shell and abutting the backing member,

said energy absorbing means including a plurality of elastomeric bellows elements having axes positioned essentially parallel to the direction of travel of the vehicle,

said energy absorbing means comprising separate, individual bellows members, said bellows member being positioned side-by-side within said outer shell,

said bellows members being essentially square in transverse cross section.

3,897,096

STEEL BARREL HANDLING APPLIANCE

Harry F. Garrison, 7470 Gerald Ave., Warren, Mich. 48092, and Billy T. Kiser, 542 S. Manitou St., Clawson, Mich. 48017

Filed Mar. 18, 1974, Ser. No. 452,776
Int. Cl.[2] B65G *65/24*
U.S. Cl. 294—4 **5 Claims**

1. A handling appliance for rolling on one of its ends a barrel or drum having an outwardly projecting annular end rim, said appliance comprising

a substantially vertical handle,

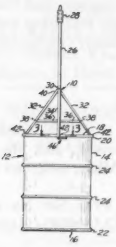
three substantially rigid barrel-handling arms having upper and lower ends thereon,

said upper ends of said arms being connected to said handle,

said arms being inclined downward and outward away from their connections to said handle in a substantially rigid tripod formation extending substantially to the rim of the barrel or drum,

said lower ends of said three arms being disposed in circumferentially spaced relationship upon a circular arc exceeding a semicircle,

and a rim-gripping element secured to each of said lower ends of said arms,



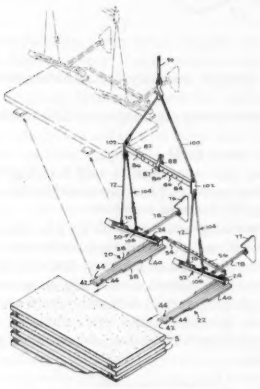
at least one of said elements being adjustably mounted on the lower end of its respective arm for motion toward and away from the elements on the other arms.

3,897,097

FLYING FORK-TYPE LIFTING MEMBER

Howard G. Davis, Jr., Hillside Manor B-12, Franklin, Tenn. 37064

Filed Jan. 7, 1974, Ser. No. 431,313
Int. Cl. B66c *1/22*
U.S. Cl. 294—67 R **6 Claims**



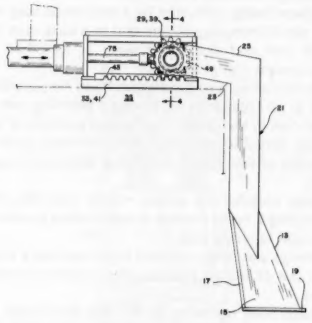
1. A flying fork-type lifting means capable of being suspended from a crane or the like for engaging and lifting structural slabs, pipe or similar materials, said lifting member comprising first and second elongated generally horizontal parallel load support arms, each of said horizontal parallel load support arms having a free outer end and a supported end, first and second lift arms respectively having one end supportingly connected to the supported end of said first and second load support arms and extending upwardly at an acute angle above said first and second load support arms, spacer frame means connected between said load support arms for maintaining a fixed spacing between the supported ends of said first and second load support arms and hoisting means supportingly connected to said lift arms for enabling a unitary vertical balanced movement of said load support arms, said lift arms and said spacer frame means along with any items supported by said load support arms while maintaining said load support arms in general horizontal orientation, wherein said spacer frame means comprises first and second spacer frame components telescopically associated with each other and means connecting said spacer frame components in adjusted position for achieving a desired overall length for said spacer frame means, wherein said hoisting means includes a transverse horizontal spacer lift bar having first and second ends respectively positioned above said first and second lift arms, said transverse horizontal spacer lift bar comprising first and second telescopic bar members and means for fixedly connecting said first and second telescopic bar members in fixed positions of adjustment for providing a desired length for said lift bar, first and second heavy-load supporting sling members respectively connected between said first and second ends of said horizontal spacer lift bar and outer portions of said first and second lift arms, the lower ends of said heavy-load supporting sling members being connected to said first and second lift arms in a vertical plane extending substantially through the center of gravity of said lifting member and any heavy-load supported on said load support arms, first and second light-load sling members respectively connected to said first and second ends of said horizontal spacer lift bar and having lower ends connected respectively to said first and second lift arms at a location on said lift arms between the connection of said heavy-load slings to said lift arms and the juncture of said lift arms and said load support arms in a vertical plane extending substantially through the center of gravity of said lifting member when there is no load on said load support arms wherein said first and second light-load sling means each comprises a relatively non-stretchable portion and a spring portion connected thereto, said spring portion being of such strength as to resist elongation when said load support arms are not supporting a work load, but elongating upon the application of a work load to said load support arm so that the end of said load support arm connected to said lift arm pivots downwardly a small amount to result in a positioning of the center of gravity of said lifting member and work carried thereby in a vertical plane in which said heavy load bearing slings are substantially positioned so that said heavy-load bearing sling provides balanced support for said load support arms and airfoil means mounted on said lifting means and being reactive with air flow over said lifting means for providing a torsional positioning force for orienting said lifting means in a desired rotational position about a vertical axis.

3,897,098

CORNER GUIDES

William Milton Haertig, 173 Vernal Dr., Alamo, Calif. 94507

Filed Apr. 15, 1974, Ser. No. 460,796
Int. Cl.[2] B66C *1/66*
U.S. Cl. 294—81 SF **1 Claim**



1. Improved retractable corner guides for a lifting spreader each comprising,

an inverted funnel section which in operative position depends down from a corner of the lifting spreader,

an L-shaped connecting arm secured to said funnel section and having a pinion gear secured to the other end thereof in fixed relation thereto, one leg of said L-shaped connecting arm being formed by two parallel pivotal leg members disposed on opposite sides of said pinion, said

pivotal leg members having slotted co-axial holes formed in the ends thereof perpendicular to the plane of said L-shaped connecting arm, and said pinion having a keyed shaft disposed along its axis and extending beyond the sides thereof for engagement with said slotted holes formed in the ends of said pivotal leg members of said connecting arm whereby said connecting arm is keyed to said pinion gear to rotate therewith,

a flat rack gear mounted on said lifting spreader at the top thereof generally on a line which bisects the 90° angle formed by the corner of the lifting spreader, said flat rack gear being formed to mesh with said pinion gear secured to said connecting arm,

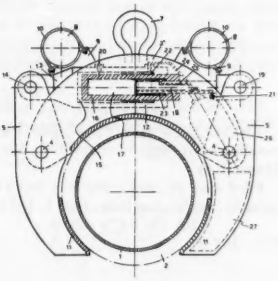
a guide means for maintaining said pinion gear in engaged relation with said rack gear as it rotates therealong, and a hydraulic cylinder secured to said spreader and engaged in journalled relation with said pinion, said hydraulic cylinder being adapted to power the pinion gear for combined rotational and translational movement of said pinion gear along said rack gear whereby said inverted funnel section can be rotated in a vertical plane by means of said connecting arm while concurrently being translated on a line coincident with the alignment of the rack gear for rotation and translation from the operative position to a position above and retracted from the perimeter of the lifting spreader.

3,897,099

TONG APPARATUS OPERATED OLEOPNEUMATICALLY FOR LIFTING A SUBMERGED PIPELINE

Ambrogio Scodino, San Donato Milanese, and Adalberto Raimondi, Nerviano, both of Italy, assignors to Saipem S.p.A., Milan, Italy

Filed Dec. 19, 1973, Ser. No. 426,129
Claims priority, application Italy, Dec. 20, 1972, 33279/72
Int. Cl.[2] B66C *1/30*
U.S. Cl. 294—88 **6 Claims**



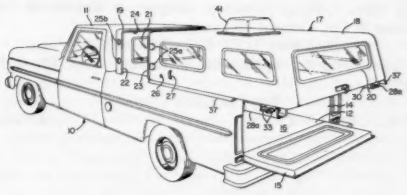
1. Tong apparatus operated oleopneumatically for lifting a submerged pipeline, comprising a central body having a curvilinear shape adapted to the outer diameter of the pipeline to be lifted, at least one pair of jaws for grasping and lifting the submerged pipeline which is connected to the side ends of said body and normally maintained in an open position while the tong apparatus is lowered about the submerged pipeline, a double acting cylinder for controlling said jaws which includes two pistons, said cylinder having a body pivotally connected to the upper end of one of said jaws with an active chamber wherein the first piston with a wide cross-section slides, while the second piston has a small-cross section and is pivotally connected to the upper end of the other of said jaws and slides coaxially with respect to the first said piston in a second active chamber in the wide cross-section of the first said piston, oleopneumatic means operatively connected to said active chambers for providing oil thereto for causing said pistons to move said normally open jaws to first close and approach the pipeline and then to grasp the pipeline for lifting thereof by the use of small quantities of oil, and control means connected to said oleopneumatic means which controls the flow of oil from said oleopneumatic means first to said second active chamber where the oil acts against the piston having a small cross-section to effect the relatively wide shifting required for the jaws to approach the pipeline with the use of small quantities of oil, and then to said first active chamber where the oil acts against the piston having a wide cross-section to effect the relatively small shifting required to have the jaws grasp the pipeline for the lifting thereof, also with the use of small quantities of oil.

3,897,100

TRUCK BODY COVER AND MOUNTING MEANS THEREFOR

Tom Gardner, 5907 Swiss Ave., Dallas, Tex. 75214

Filed Nov. 23, 1973, Ser. No. 418,278
Int. Cl. B60j *7/02*
U.S. Cl. 296—10 **6 Claims**



1. Apparatus for retractably covering in a substantially weathertight sealing configuration an open topped cargo space portion of a pick-up truck body of the kind having the truck cab forward of the cargo space, said cargo space being formed by upstanding side and front walls having generally straight top edges and enclosable by a tailgate section along a backwall, and said apparatus providing selective access to the frontal portion of said cargo space and comprising:

a generally rigid elongate cover of length and width substantially equivalent to that of said cargo space and having first and second longitudinal side sections forming an open ended U-shape frontal portion contiguous to and extending generally upwardly with respect to a longitudinally extending open bottom portion and adapted for substantially covering the cargo space of the truck;

a bulkhead mounted to and upwardly extending from the front wall of said cargo space and having an upwardly extending height and width substantially equivalent to the height and width of the open ended frontal portion of said cover and the upwardly extending cab of the truck adjacent thereto, said bulkhead being adapted for abuttingly receiving on the face thereof the frontal edge of said open ended U-shaped frontal portion of said cover;

means associated with said bulkhead for sealingly engaging the open ended frontal edge of said cover in abutting engagement therewith, and forming a frontal wall thereto, whereby said cargo space may be substantially enclosed by positioning said cover atop said cargo space and adjacent said bulkhead;

first and second rail members, each mounted at the top edge of one of the side walls in parallel spaced relationship with the other and having rearwardly extensible telescoping portions adapted for bilateral movement rearwardly from and forwardly to said bulkhead for supporting the rearward portion of said cover when positioned thereon in a generally horizontal plane rearwardly extending from the truck;

antifriction means mounted along the bottom edges of said first and second side sections of said cover in position to run in said rails and said rearwardly extensible telescop-

ing portions thereof for providing a bilateral movement of said cover over the open topped portion of the truck rearwardly from and forwardly to said bulkhead for providing access to the frontal portion of said cargo space;

lock means for releasably securing said cover in sealable engagement with said bulkhead whereby said cover will selectively maintain its engagement with said bulkhead in a substantially weathertight sealing configuration;

means for sliding said cover along said rails rearwardly from and forwardly to said bulkhead to provide access to the frontal portion of said cargo space adjacent to the cab of the truck; stop means on said rails limiting rearward travel of said antifriction means and said cover mounted thereto, whereby the distance of movement of said cover over said cargo space is defined by said bulkhead for movement forwardly thereto, and by said stop means for movement rearwardly from said bulkhead.

3,897,101

DRIVER'S SEAT WITH INERTIA-RESPONSIVE LOCKING ARRANGEMENT

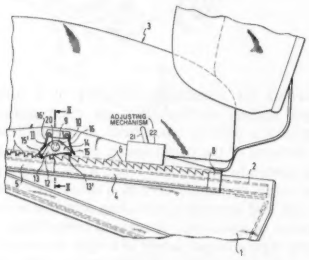
Peter Hess, Coburg, Germany, assignor to Metallwerk Max Brose & Co., Coburg, Germany

Filed May 7, 1974, Ser. No. 467,625

Claims priority, application Germany, May 18, 1973, 2325292

Int. Cl.[2] B60N 1/08

U.S. Cl. 296—65 A **8 Claims**



1. A seat arrangement for a motor vehicle comprising:

a. a base member and main locking system;

b. a seat member mounted on said base member for adjusting movement in a predetermined direction;

c. an inertia operated auxilary locking system comprising a row of alternating teeth and gaps extending in said direction on one of said members, said teeth being fixedly secured to said one member;

d. a two-armed lever mounted on the other member for pivoting movement about an axis transverse to said direction,

1. one arm of said lever having a terminal pawl portion shaped for being lockingly received in said gaps in a first angular position of said lever,

2. the other arm of said lever having a terminal contact portion shaped to prevent said contact portion from being received lockingly in said gaps; and

e. biasing means biasing said lever toward a second angular position,

1. said contact portion sequentially engaging said teeth during said movement of said seat member while said lever is in said second position,

2. said pawl portion clearing said teeth in said second position of said lever, and

3. said pawl portion being spaced from said contact portion in said direction, the auxilary locking system further comprising a pivot pin on said other member, said lever being mounted on said pivot pin for pivoting movement about said axis, guide means on said other member for guiding said pivot pin transversely to said direction and said axis between an operative position remote from said row and a locking position adjacent said row, said pawl portion clearing said teeth in said second angular position of the lever and said contact position clearing said teeth in said first angular position of said lever when the lever is in said operative position, said pawl portion being received in one of said gaps and said contact portion abuttingly engaging one of said teeth in said locking position of said pivot pin.

3,897,102

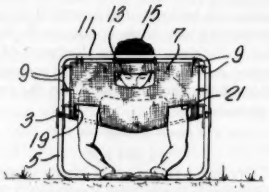
CHAIR OR THE LIKE

Gerald Lemaire, 248 Elgar, Apt. 405, Ile des Soeurs, Montreal 201, Quebec, Canada

Filed Apr. 8, 1974, Ser. No. 459,105

Int. Cl. A47c 7/62, 31/00

U.S. Cl. 297—191 **13 Claims**



1. A chair or the like comprising a frame, a relatively thin flexible material associated with said frame for supporting the body of a person, said chair including a pivotally connected back portion, said back portion formed with a first aperture above said pivotal connection, said aperture being shaped to enable a person who lies flat on his stomach to rest his head on a portion of said flexible material surrounding said first aperture while being able to see through said first aperture, said pivotally connected back portion also including second and third apertures adjacent said pivotal connection adapted to permit passing the arms of the person therethrough.

3,897,103

ARTICLE OF OFFICE FURNITURE

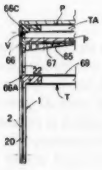
Alberto Rosselli, c/o Dr. Ing. Misitano A.G., Via Padova, 217, 20127 Milan, Italy

Filed May 21, 1973, Ser. No. 362,272

Claims priority, application Italy, June 5, 1972, 956147/72

Int. Cl. A47b 47/00

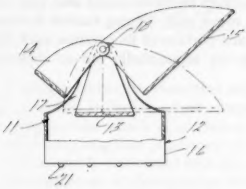
U.S. Cl. 312—257 R **1 Claim**



1. An article of office furniture comprising at least two frames of aluminum alloy each having a quadrilateral profile and including a pair of uprights, each upright being provided with two opposite grooves delimiting a core, said core having a plurality of spaced recesses for the engagement of first hook-shaped components, each upright having a notch in said core at the terminal ends thereof, and a transverse hole in said

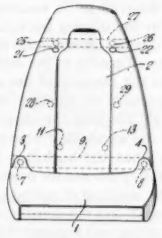
core adjacent to said notch, said transverse hole having an axis extending parallel to the axis of said recesses, a second hook-shaped component having a hook of U-shape and provided with two opposite holes arranged to be aligned with, and on opposite sides of, said transverse hole when the second hook-shaped component is mounted astride one of said notches, and a connection means engagable in the holes in said second hook-shaped component and in the aligned transverse hole in the core to secure the second hook-shaped component to the frame, each upright being provided with a peripheral step to receive a covering panel to be secured to the frame.

3,897,104
CONVERTIBLE SWINGABLE CHAIR
John O. Black, 18094 Parkside, Detroit, Mich. 48221
Filed May 1, 1974, Ser. No. 465,834
Int. Cl.[2] A47C *3/00*
U.S. Cl. 297—353 **10 Claims**



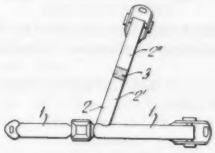
1. In a swingable chair, a base having a continuous band forming a bottom supporting portion from which two upstanding oppositely disposed pedestals extend, a chair unit made of a central and two end sections of U-shape having a central portion and oppositely disposed upstanding arms located between said pedestals, and a pair of pivots for securing the arms of said sections together and to the upper portion of said pedestals.

3,897,105
VEHICLE SAFETY BELT SYSTEM
Takezo Takada, Hikone, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan
Filed Apr. 4, 1973, Ser. No. 347,986
Claims priority, application Japan, Apr. 17, 1972, 47-37810
Int. Cl.[2] A62B *35/00*
U.S. Cl. 297—389 **7 Claims**



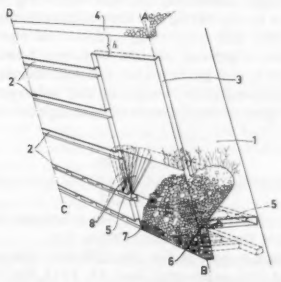
1. In combination with a vehicle seat having a back portion including a front face and a reinforcing frame provided with upper and lower cross members extending for substantially the width of said back portion, a guide roller mounted on each of said cross members proximate a side of said back portion, a pair of seat belts extending rearwardly from forward of said seat back portion about respective guide rollers and fixedly anchored at their rear ends to stationary points on said seat back portion remote from said respective guide rollers, the front ends of said belts being interconnected, and a separable coupling member attached to the front portion of at least one of said belts.

3,897,106
VEHICLE SAFETY BELT
Takezo Takada, 1742 Hikotomi-cho, Hikone, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan
Filed July 16, 1973, Ser. No. 379,294
Claims priority, application Japan, July 22, 1973, 48-73030
Int. Cl.[2] A47D *15/00;* **B60R** *21/10*
U.S. Cl. 297—389 **7 Claims**



1. A vehicle safety belt of the three point type for restraining an occupant in a seat comprising a shoulder belt including upper and lower sections joined in series at an elongation transition section which is disposed at the normal position of the shoulder of said seat occupant when said shoulder belt is in applied position, and a lap belt coupled to said shoulder belt to form a three point safety belt system, said shoulder belt upper section having a greater elongation per unit length at a predetermined load than said shoulder belt lower section and than said lap belt and further characterized in that said belt upper section possesses an elongation versus load characteristic wherein said belt upper section recoverably extends with increasing load up to a predetermined value and then non-recoverably extends under little load increase for a predetermined elongation and thereafter further recoverably extends with increased load to a predetermined point, release of the stress thereafter on said belt upper section resulting in its contraction to a length greater than its original length by substantially said non-recoverable elongation.

3,897,107
METHOD OF MINING
Mats Torbjorn Haglund, Malmberget, Sweden, assignor to Luossavaara-Kiirunavaara Aktiebolag, Stockholm, Sweden
Filed June 1, 1973, Ser. No. 365,854
Claims priority, application Sweden, June 28, 1972, 8480
Int. Cl. E21c *37/14*
U.S. Cl. 299—13 **1 Claim**



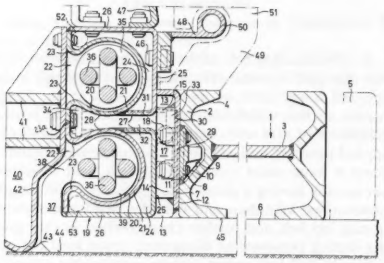
1. A method of mining ore fron an ore body (1) which comprises driving a number of drifts at suitable vertical distances along the footwall (2) of the body; drilling blast holes from said drifts through an arrangement of a fan-shaped pat-

tern (8) of said blast holes partly in such a manner that, after blasting, a slot-shaped opening (3) is obtained in the ore body along the footwall and partly in such a manner that as large part as possible of the ore body is undercut whereby a lowermost heading and an associated heading (5) with connecting crosscuts (6) are utilized as main discharging level, which main discharging level is supplemented with an additional underlying discharging level.

3,897,108
LONG-WALL MINING APPARATUS

Reinhold Krohm, Herne, and Karl Bahre, Gladbeck, both of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed Oct. 24, 1974, Ser. No. 517,841
Claims priority, application Germany, Nov. 7, 1973, 2355558
Int. Cl.[2] E21C 27/35
U.S. Cl. 299—34 **31 Claims**



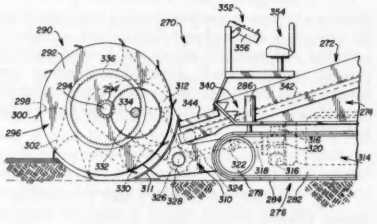
1. In a long-wall mining apparatus, a combination comprising an elongated conveyor adapted to extend along a mine face and having a bottom, one longitudinal side facing towards and another longitudinal side facing away from said mine face; an elongated casing, mounted on said conveyor at said other side and extending therealong upwardly of said bottom, said casing having two vertically spaced longitudinally extending cylindrical guide tracks each formed with a longitudinal slot at a side of said casing; a plurality of mounting members spaced along said casing and each fixedly embracing the respective guide tracks, said mounting members extending downwardly to substantially the level of said bottom; a ground-engaging support structure carried by said mounting members and projecting downwardly of said bottom adjacent said casing; an endless reciprocating drive chain having an upper and a lower run received in the respective guide tracks; and a coal plough located at said one side of said conveyor and having a rigid connecting portion extending beneath said bottom face to said casing and connected with one run of said chain, so that said connecting portion and coal plough are reciprocated lengthwise of said conveyor when said chain reciprocates in said guide tracks, and said connecting portion is in part relieved of the weight of said conveyor and casing due to the ground-engagement by said support structure.

3,897,109
MULTI-WHEELED EXCAVATING AND LOADING SYSTEM

Charles R. Satterwhite, Dallas, Tex., assignor to Southwest Equipment Developers, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 238,089, March 28, 1972, abandoned. This application Sept. 24, 1973, Ser. No. 400,043
Int. Cl. E02f 3/24
U.S. Cl. 299—39 **45 Claims**

1. An excavating and loading system comprising:
an excavating wheel assembly comprising axle means and at least two rigid excavating wheels rotatably mounted cantilever on and supported on the axle means, said excavating wheel assembly having a width at least equal to the widest portion of the remainder of the system;
each of said excavating wheels including a plurality of digging buckets located immediately adjacent one another to define the entire circumference of the excavating wheel, each bucket having a cutting edge which extends to a stationary wall and a wall mounted for pivotal movement from a material receiving position to a material dumping position;
supporting and housing means extending between the excavating wheels and connected to the axle means for supporting the excavating wheel assembly;
each of said digging buckets extending continuously between a side wall thereof located immediately adjacent to the supporting means and a side wall thereof defining one end of the excavating wheel assembly;
drive means extending through the supporting and housing means for rotating the excavating wheels so that the digging buckets follow a circular path;
said digging buckets being oriented and said drive means operating to move each digging bucket downwardly during the forward portion of its rotation such that the digging buckets are sequentially moved downwardly into

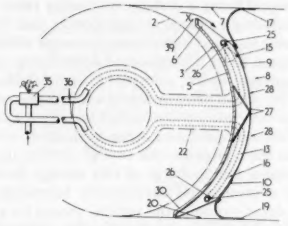


engagement with material to be excavated whereby the material engaged by the digging buckets is supported by the ground below thereby allowing the digging buckets to cut off relatively small pieces of the material;
means located within the margins of the excavating wheel assembly and responsive to rotation of the excavating wheels for positively pivoting the movable wall of each digging bucket of the excavating wheels to the material receiving position when the bucket is in the lower and forward portion of the path and for positively pivoting the movable wall to the material dumping position when the bucket is in the upper and rearward portion of the path;
a vehicle for supporting and manipulating the excavating wheel supporting means and thereby positioning the excavating wheel assembly in engagement with material to be excavated; and
conveyor means mounted on the vehicle entirely behind the excavating wheel assembly for movement around a course including a relatively low portion positioned to receive material from the digging buckets of the excavating wheels upon the positioning of the movable walls of the buckets in the material dumping position and a relatively high material delivery portion located rearwardly on the vehicle from the low portion.

3,897,110
MINING EQUIPMENT

James Malcolm Agnew, Burton-on-Trent, England, assignor to Coal Industry (Patents) Ltd., London, England

Filed June 18, 1974, Ser. No. 480,512
Claims priority, application United Kingdom, July 11, 1973, 33043/73
Int. Cl. E21c *35/20*
U.S. Cl. 299—45 10 Claims

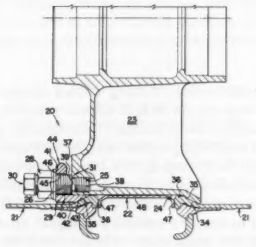


1. A loading member for mounting adjacent to a cutter on a mining machine, including a first component assembly having a loading surface which in use when the loading member is mounted on the machine is adjacent to the cutter, a second component assembly associated with the said first component assembly to define an air flow passage having an air flow inlet positioned adjacent to one margin of the said first component assembly, and air flow inducing means including a nozzle for directing an air flow inducing spray along the said passage.

3,897,111
RIM MOUNTING

William D. Walther, Dayton, and Robert A. DeRegnaucourt, Centerville, both of Ohio, assignors to Dayton-Walther Corporation, Dayton, Ohio

Filed Jan. 22, 1973, Ser. No. 325,510. The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.
Int. Cl. B60b *23/10*
U.S. Cl. 301—12 R 8 Claims

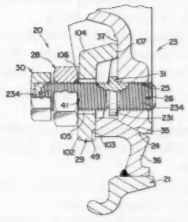


1. An assembly for mounting of at least one rim having a mounting flange on the felloe of a wheel,
said assembly comprising a series of support bolts, fastening nuts and clamp elements,
said wheel having a series of axially directed bores adjacent said wheel felloe for rotatably receiving the axially inner portion of a support bolt,
each support bolt having a medial portion with external threads for rotatably mounting a fastening nut,
each fastening nut having a radially oriented flange surface for engaging a clamp element,
each clamp element having an axially directed bore for housing said support bolt and an axially directed portion for engaging the rim mounting flange,
the axially outer portion of a support bolt having a cap head thereon which when rotated will cause a fastening nut on said bolt threads to engage said clamp element and move said clamp element axially toward the rim mounting flange,
there being stop means on the medial portion of a support bolt to limit the extent of axially inward movement of a fastening nut and clamp element,
whereby, subsequent rotation of a fastening nut away from said cap head will fully seat the rim on the wheel.

3,897,112
RIM MOUNTING

William D. Walther, Kettering, and Robert A. DeRegnaucourt, Centerville, both of Ohio, assignors to Dayton-Walther Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 325,510, Jan. 22, 1973. This application Dec. 26, 1973, Ser. No. 428,088. The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.
Int. Cl. B60b *23/10*
U.S. Cl. 301—13 SM 10 Claims



1. An assembly for mounting at least one rim with a mounting flange on the felloe of a wheel,
said assembly comprising a series of threaded support bolts, fastening nuts and clamp elements,
said wheel having a series of axially directed bores adjacent said wheel felloe for rotatably receiving threads on the axially inner end of a support bolt,
each fastening nut being rotatably mounted on threads on the medial portion of a support bolt and having a radially oriented flange surface for engaging a clamp element,
each clamp element having an axially directed bore for housing a support bolt and an axially directed portion for engaging the rim mounting flange,
each support bolt having a stop collar formed integrally thereon between the threads received in a wheel bore and the threads mounting a fastening nut,
said stop collar being formed at a precise location according to predetermined functional dimensions and tolerances of said rim flange and said wheel and having an effective outer diameter greater than the inner diameter of said bore in a clamp element,
the axially outer portion of a support bolt having a cap head secured thereon after insertion of said axially outer portion through the bore of a clamp element and then through a fastening nut,
said cap head when rotated causing a fastening nut on said bolt threads to engage a clamp element and move said clamp element axially toward the rim mounting flange until said stop collar contacts said wheel,
whereby, subsequent rotation of a fastening nut away from said cap head will move a clamp element to fully seat the rim on the wheel.

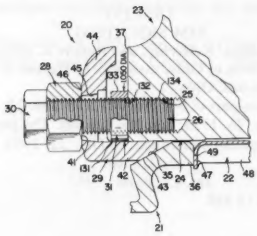
3,897,113
RIM MOUNTING

William D. Walther, Kettering, and Robert A. DeRegnaucourt, Centerville, both of Ohio, assignors to Dayton-Walther Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 325,510, Jan. 22, 1973. This application Dec. 10, 1973, Ser. No. 423,310. The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.

Int. Cl. B60b *23/10*

U.S. Cl. 301—13 SM 5 Claims



1. An assembly for mounting at least one rim with a mounting flange on the felloe of a wheel,

said assembly comprising a series of support bolts, fastening nuts, clamp elements, and ring collars,

each support bolt having external threads of uniform diameter for rotatabley mounting a fastening nut and a ring collar,

said wheel having a series of axially directed bores adjacent said wheel felloe for rotatably receiving the threads of a support bolt,

each fastening nut having a radially oriented flange surface for engaging a clamp element,

each clamp element having an axially directed bore for housing a support bolt and an axially directed portion for engaging said rim mounting flange,

each ring collar being secured on a support bolt axially inwardly of a clamp element in a precise location according to predetermined functional dimensions and tolerances of said rim flange and said wheel and having an effective outer diameter greater than the inner diameter of said bore in said clamp element,

the axially outer portion of a support bolt having a cap head thereon which when rotated will cause a fastening nut on said bolt threads to engage a clamp element and move said clamp element axially toward the rim mounting flange until a ring collar contacts said wheel,

whereby, subsequent rotation of a fastening nut away from said cap head will move a clamp element to fully seat the rim on the wheel.

3,897,114
SKID CONTROL SYSTEM

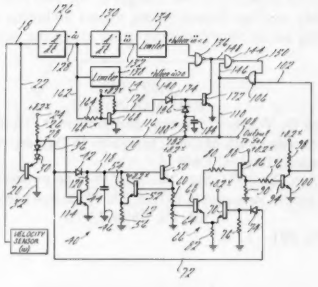
Ronald S. Scharlack, San Antonio, Tex., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Sept. 3, 1969, Ser. No. 854,876

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 BE 9 Claims

1. In a skid control system for controlling the application and release of brake pressure to at least one wheel of a vehicle, the improvement comprising sensing means for sensing the wheel angular velocity, generating means for generating a signal which is an approximation of the vehicle velocity from said wheel velocity signal and comparator circuit means for deriving a slip signal in response to said wheel and vehicle velocity signals, said generating means including means connected to said wheel velocity sensing means for establishing a characteristic of said vehicle velocity curve including establishing a starting point for said signal from said wheel velocity sensing means and means for decreasing said vehicle velocity signal independently of the actual vehicle velocity in accordance with a preselected curve when said curve is below said starting point by a preselected amount, said comparator circuit including differential circuit means for comparing the vehicle velocity signal with the wheel velocity signal during the braked portion of the cycle for stopping the vehicle and deriving an output signal when said wheel velocity signal bears a preselected relationship to the vehicle velocity signal, said vehicle velocity signal being a linearly decreasing ramp, said system further including a charge storage device, said charge storage device being supplied with electrical energy when said wheel velocity signal bears a preselected relationship to the charge on said storage device, said preselected relationship occurring when the wheel velocity signal exceeds the charge on said storage device, said system further including a circuit for discharging said storage device when said wheel velocity signal is less than the charge on the storage device, the discharge circuit causing the discharge of said storage device in accordance with a preselected deceleration relationship to approximate the deceleration of the vehicle, means for giving greater effect to said vehicle velocity signal as compared to said wheel velocity signal to create a differential between said

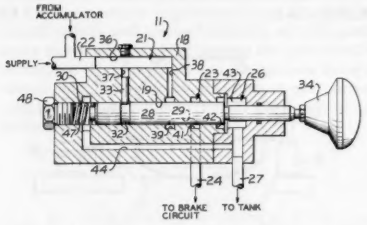


signals, said differential creating circuit means including a fixed voltage drop circuit in said vehicle velocity signal generating circuit and a fixed voltage drop circuit in said wheel velocity signal generating circuit, the fixed drop of said vehicle velocity circuit exceeding that of said wheel velocity circuit, means for generating an output signal when said wheel velocity signal falls a preselected magnitude below said vehicle velocity signal to create a critical slip signal, an output circuit for controlling the application of brake pressure, said critical slip signal providing an output signal to release brake pressure when a critical value is obtained, and slip circuit disabling means connected in responsive relationship to said output circuit, said disabling means operating to disable the slip circuit when said output signal is generated, said critical slip signal causing a brake relieving condition which relieves brake pressure on the vehicle wheels, said skid control system further including pressure applying circuit means including first signal generating circuit means responsive to said wheel velocity signal for generating a rate of change of wheel acceleration signal and second circuit means for generating a wheel acceleration signal and output gate means correlating said rate of change of wheel acceleration signal and said wheel acceleration signal to control the reapplication of brake pressure to the wheels.

3,897,115
CONTROL VALVE FOR HYDRAULIC CIRCUIT

Robert L. DeGeeter, and George E. Schubert, both of Aurora, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 14, 1973, Ser. No. 415,721
Int. Cl.[2] B60T 15/16
U.S. Cl. 303—71 11 Claims

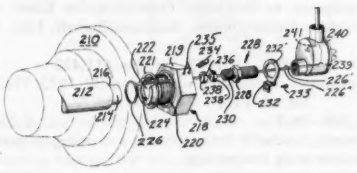


1. Control valve means for controlling a hydraulic circuit supplying fluid to an automatically actuated-pressure released brake including; a valve body having a bore means therein, first passage means in said valve body for communicating said bore means with a fluid supply source for said hydraulic circuit, second passage means in said valve body for communicating said bore means with said pressure released brake, third passage means communicating said bore means with a drain means, valve member means disposed within said bore means positionable in a first position for communicating fluid between said first passage means and said second passage means while concurrently preventing fluid flow between said second passage means and said third passage means, said valve member means being further positionable in a second position for communicating fluid between said second passage means and said third passage means while concurrently preventing fluid flow between said first passage means and said second passage means, said valve member means including means for allowing said valve member means to be automatically positionable in said second position upon the attainment of a predetermined low level of fluid pressure in said hydraulic circuit, said valve member means being further manually movable to said second position and said first position, said valve member means in said first position communicating said fluid supply source with said pressure released brake to release said brake and said valve member means in said second position communicating said brake with said drain means for automatically engaging said brake.

3,897,116
BEARING WEAR DETECTOR

Richard G. Carpenter, Horsham Township, Montgomery County, Pa., assignor to Crane Co., New York, N.Y.

Continuation-in-part of Ser. No. 187,266, Oct. 7, 1971, abandoned. This application Mar. 19, 1973, Ser. No. 342,663
Int. Cl. F16c 41/00
U.S. Cl. 308—1 A 5 Claims

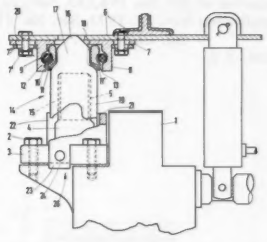


1. In combination with a bearing and rotating shaft assembly, a wear detector, said wear detector comprising a closed electrically conductive wire loop, an insulated covering on said wire loop, a holder, said holder including a mounting shank terminating in a recessed end positioned about an end portion of the shaft in outwardly spaced relation thereto, the covered loop being positioned within said recessed end for mounting thereby in outwardly spaced surrounding relation to the end portion of the shaft, said insulated covering insulating said loop from the shaft completely thereabout for abrasion by the shaft upon radial displacement of said shaft in any direction upon a wearing of the bearing to effect an electrical connection between the shaft and wire loop, conductor leads extending from said loop, and alarm means electrically engaged with said leads.

3,897,117
CENTERING DEVICE FOR A RAIL BRAKE MAGNET

Ernst Katzer, Munich, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed July 12, 1974, Ser. No. 488,258
Claims priority, application Germany, July 20, 1973, 2336999
Int. Cl.[2] F16C 29/02; F16d 65/34
U.S. Cl. 308—3 R 8 Claims

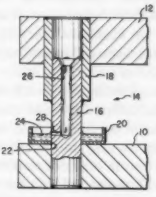


1. A device for aligning a rail brake magnet in the raised inoperative position with respect to the vehicle structure from which it is suspended, comprising a guide element on said vehicle structure and having a centering bore with a first conical surface around said bore, a centering pin having a conical surface on one end thereof and its other end mounted on said magnet, a first cylindrical surface on said centering pin adjacent said conical end surface and having a diameter approximately equal to that of said centering bore so as to be received therein, and a second conical surface diverging from said first cylindrical surface and engageable with said guide element conical surface when the magnet is in its raised position.

3,897,118
ANTI-FRICTION DIE SET

Maurice Wolfthal, Ossining, N.Y., assignor to Stewart Stamping Corporation, Yonkers, N.Y.

Filed Oct. 15, 1973, Ser. No. 406,387
Int. Cl.[2] F16C 1/26
U.S. Cl. 308—4 C 6 Claims



4. A die guide set including a vertically mounted lower leader pin, an upper guide bushing telescopically associated

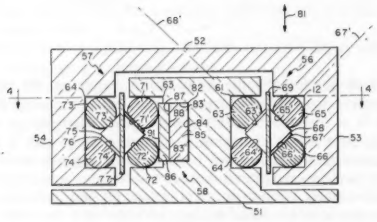
around said leader pin, an anti-friction bearing positioned between said leader pin and said guide bushing for reducing friction between said pin and said guide bushing, said bearing including a longitudinally movable frame housing a plurality of bearing surfaces, said pin having an interior passaged formed therethrough having one end opening from the top edge surface of said pin, said passage extending at least partially within and along the length of said pin, a lubricant reservoir mounted around said pin, said pin and bushing being located so that the free end of said bushing is adapted to be within said lubricant reservoir at intervals during operation of the die guide set whereby a coating of lubricant is adapted to be applied between said pin and said bushing, said interior passage extending through said pin and having its other end opening into said reservoir defining an unimpeded passage through said pin.

3,897,119

LINEAR BEARING SLIDE

Thomas McMurtrie, Medfield, Mass., assignor to Design Components, Inc., Medfield, Mass.

Continuation of Ser. No. 194,133, Nov. 1, 1971. This application Nov. 23, 1973, Ser. No. 418,368
Int. Cl. F16c *17/00*
U.S. Cl. 308—6 R **6 Claims**



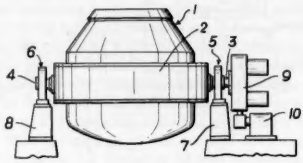
1. A slide bearing support apparatus including one member slidable on another member, the combination comprising:
   a pair of parallel slide bearing assemblies disposed between said members and each comprising;
   a pair of elongated, rectilinear rods having central axes parallel to each other, the longitudinal surfaces of each of said rods including an elongated curved portion and an oppositely directed coextending flat portion, said flat portions of said rods being spaced apart and facing each other to define an elongated rectilinear raceway;
   a plurality of rollers disposed in said raceway and contacting the flat portions on said rods; and
   rod support surfaces defined by each of said members, said support surfaces defined by said one member contacting the curved portion on one of said rods and said support surfaces defined by said another member contacting the curved portion on the other of said rods, and wherein said support surfaces are shaped so as to restrict movement of said rods in directions transverse their axes and to allow unrestrained rotational movement of the entire rods thereabout without creating torsional stresses in said rods.

3,897,120

TILTABLE CONVERTER SELF-ALIGNING BEARING

Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Oct. 31, 1973, Ser. No. 411,456
Claims priority, application Austria, Jan. 30, 1973, 777/73
Int. Cl. F16c *1/24, 23/04, 33/72*
U.S. Cl. 308—36.1 **7 Claims**



1. A support arrangement for a tiltable converter comprising a plurality of trunnions secured to the converter and a plurality of bearing assemblies that mount and support the trunnions, each bearing assembly mounting a different trunnion and at least one of the bearing assemblies including:
   a. a bearing adapted to accommodate angular and wobbling movements of one of the trunnions and having an inner ring encircling said one trunnion and an outer ring encircling the inner ring;
   b. two spacer ring assemblies encircling said one trunnion and located adjacent different ends of the inner ring of the bearing to maintain the inner ring in position axially of said one trunnion;
   c. a bearing housing encircling the bearing and including annular portions that depend radially inwardly adjacent each end of the bearing; and
   d. annular resilient means for sealing the bearing housing, at least one of the spacer ring assemblies including
      i. two arcuate spacer ring parts that have complementary circumferential extents and are juxtaposed with the inner ring of the bearing and with said one trunnion, the two spacer ring parts being disposed opposite each other about said one trunnion so that adjacent ends of the two spacer ring parts are spaced apart circumferentially of said one trunnion from each other, and
      ii. a retaining ring that closely encircles the two spacer ring parts, the outer circumferential surface of said one trunnion in a region adjacent said spacer ring parts having a conical shape and the inner circumferential surfaces of the spacer ring parts having complementary, conical shapes so that the conical surfaces of the spacer ring parts cooperate with the conical surface of said one trunnion to maintain said at least one spacer ring assembly in position axially of said one trunnion.

3,897,121

TILTABLE CONVERTER SELF-ALIGNING BEARING

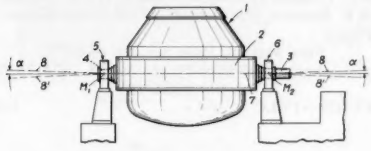
Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Oct. 31, 1973, Ser. No. 411,428
Claims priority, application Austria, Jan. 30, 1973, 776/73
Int. Cl. F16c *1/24, 23/04, 33/72*
U.S. Cl. 308—36.1 **5 Claims**

1. A bearing assembly for supporting a carrying trunnion of a tiltable converter comprising:
   a. bearing for journaling a carrying trunnion and being adapted to accommodate angular and wobbling movements of the trunnion;
   b. a bearing housing enclosing the bearing and including (i) two annular, radially inwardly depending flange portions

located at different ends of the housing and (ii) sealing means including an annular, axially extending sleeve portion located at a radially inward end of each flange portion of the housing;

c. at least one spacer ring located adjacent each end of the bearing, the spacer rings being adapted to encircle a carrying trunnion and to be secured on the trunnion so as to fix the bearing in position axially of the trunnion, a recess being formed in the radially outer periphery of said at least one spacer ring at each end of the bearing to extend axially and circumferentially of said spacer ring and a sleeve portion of the housing being received in each recess, the sleeve portions and the recesses being dimensioned and located such that the sleeve portions are adapted to be spaced both radially and axially of adjacent surfaces of the spacer rings; and



d. a pasty sealing agent filling spaces between the sleeve portions and the spacer rings;

each sleeve portion having at least one flange projecting radially inwardly of the sleeve portion and the recesses of the spacer rings being correspondingly configured to receive the flanges of the sleeve portions so that said flanges are spaced from adjacent surfaces of the spacer rings, at least one flange on each sleeve portion being located between opposite ends of the sleeve portion, radially extending lateral surfaces of the flanges of the sleeve portions and adjacent radially extending surfaces of the spacer rings having spherical configurations all generated from a common center point located adjacent the center of the bearing.

3,897,122

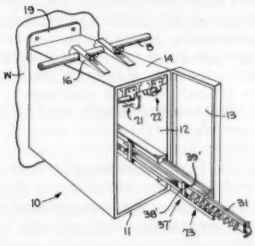
NECKWEAR CABINET

Wilber C. McEvers, 655 Ave. C, S.W., Winter Haven, Fla. 33880

Filed May 14, 1973, Ser. No. 360,072

Int. Cl. A47b *88/00, 95/00*

U.S. Cl. 312—321 **2 Claims**



1. A neckwear support and display cabinet comprising a plurality of guideways mounted in said cabinet, a plurality of telescoping bars slidably mounted in said guideways, each of said bars including at least two interfitting sections, means for supporting neckwear connected to said bars, said supporting means comprising at least a first set of hangers connected to one bar for hanging a first type of neckwear and a second set of different hangers connected to another bar for a second different type of neckwear, and mounting means for said cabinet, the neckwear supporting sections of said telescoping bars being individually extendable outside said cabinet whereby a relatively large volume of diverse neckwear may be stored and neckwear types individually displayed for selection, wherein said mounting means includes at least one mounting bracket for engaging a clothes rod in a closet, said mounting bracket being elongated and including a transverse cutout to receive said clothes rod, said bracket containing a longitudinal slot, and fastening means extending through said slot for adjustably attaching said cabinet to said brackets.

3,897,123

DEVICE FOR CONTROLLING THE LOCKING OF CONTAINERS ON AN ORBITABLE CARRIER OF AN ARTICLE STORAGE DEVICE

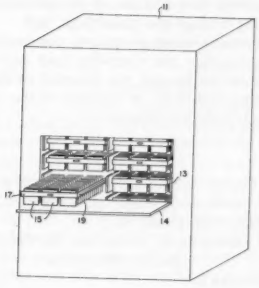
Gerhard Ludwig Schmitt, Bellheim, Germany, assignor to Sperry Rand Corporation, Blue Bell, Pa.

Filed Apr. 23, 1974, Ser. No. 463,330

Claims priority, application Switzerland, Apr. 25, 1973, 5860/73; Germany, June 7, 1973, 2329127

Int. Cl.² A47B *88/00*

U.S. Cl. 312—333 **3 Claims**



1. Apparatus for controlling the locking of a container or the like on an orbitable carrier of an article storage device, said apparatus comprising:

locking means including a pair of lock bolts mounted on the front of the container and movable relative to the associated carrier for engagement therewith when the container is in a fully closed position so as to lock the container to the carrier,

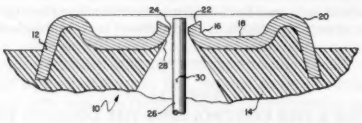
means including a pair of spring actuated members each affixed to the carrier adjacent a respective side of the container for acting against the container as it approaches the fully closed position so that if the container does not lock to the carrier, the spring actuated members force the container outward to protrude from the front of the carrier a predetermined distance, and

light barrier means including a light source and a light detector disposed on opposite sides of the carrier adjacent the front of the article storage device, the light detector normally receiving light from the light source in a locked condition of the container to enable orbital motion of the carrier but the container acting when protruding from the carrier to block the light path from the light source to the detector and thereby inhibit orbital motion of the carrier.

3,897,124
LAMP BASE ASSEMBLY

Gasper Pagnotta, Schenectady, and William G. Moffatt, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 14, 1973, Ser. No. 415,628
Int. Cl. H01r *11/06*
U.S. Cl. 339—145 T 16 Claims

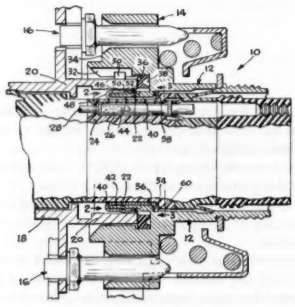


1. An electrically conductive ferrule comprising:
a. an electrically conductive material;
b. two major opposed surfaces substantially parallel to each other;
c. a raised boss having a wall member extending from one of the two major surfaces, the wall member having a re-entrant portion located remote from the one major surface and an interior wall surface defining an aperture extending entirely through the ferrule and the boss;
d. a raised rim encircling the raised boss and extending from the one major surface,
e. an electrical lead disposed in the aperture and extending upwardly through the raised boss, and
f. a substantially sound electrically conductive weld nugget joining together the electrical lead and the re-entrant portion of the ferrule, the material of the weld nugget consisting essentially of material of the raised boss and material of the electrical lead.

3,897,125
CAPTIVATED GROUNDING SPRING

Norman R. Anderson, Cicero, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed July 12, 1974, Ser. No. 488,176
Int. Cl. H01r *3/06*
U.S. Cl. 339—14 L 13 Claims

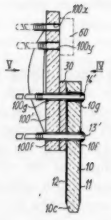


11. A grounding spring and connector shell assembly comprising;
a connector shell having an annularly shaped front end with a radially outwardly extending shoulder formed in the internal surface of said shell spaced rearwardly of said front end and a key extending axially rearwardly of said shoulder;
an annularly shaped portion of resilient conductive material having an axial passageway therein extending between opposite axial ends of said portion for enabling reduction in the circumferential dimension of said portion for receipt in said front end;
a plurality of cantilever spring fingers formed at one axial end of said portion and folded back in overlapping radially outwardly spaced relationship to said portion for receiving front end of said shell between said fingers and said portion;
an annularly shaped radially outwardly extending lip formed at the other axial end of said portion and engaging said shoulder on the internal surface of said shell for preventing axial movement of said portion toward said front end; and passageway means in said lip for receiving said key to hold said portion against rotational movement relative said shell.

3,897,126
DOUBLE-SIDED PRINTED CIRCUIT CONNECTION BOARD WITH INSERTABLE MALE CONNECTOR PLUG

Andre L. Frances, 1, Allee des Ajoncs, 22300 Lannion, and Jack E. Brochon, Rue Surcouf, 22700 Perros-Guirec, both of France

Filed May 14, 1974, Ser. No. 469,773
Claims priority, application France, June 8, 1973, 73.21024
Int. Cl.[2] H05K *1/04*
U.S. Cl. 339—17 LC 1 Claim



1. A connecting device comprising:
a rectangular board having at its upper part a plurality of rows of holes parallel to the upper edge of said board and at its lower part two rows of holes parallel to said upper edge;
first conductive pins inserted in the holes of the upper part of the board and projecting from the front side of said board which are adapted at their rear ends for connecting electrical components set near the back side of said board by soldering the terminals of said components to said pins;
a printed circuit connecting plate which is parallel to said board and faces the lower part thereof, said printed circuit connecting plate having equally spaced parallel conductive strips on each side extending from the lower edge of said plate and which are drilled at their ends remote from said edge with holes forming two spaced rows of holes opposite to the rows of holes of the lower part of said board;
said printed circuit connecting plate having a part extending below the lower edge of said board;
an insulating plate;
said insulating plate being sandwiched between said lower part of said board and said printed circuit plate which is drilled with holes having the same pattern as on said printed circuit connecting plate and said rectangular board;
second conductive pins adapted for passing through selected associated holes of said board, said insulating plate, and said printed circuit connecting plate perpendicularly with respect to said connecting device and which are soldered with corresponding conductive strips of said printed circuit connecting plate and which project from the front side of the lower part of the board; and,
conductive wires wrapped around projecting parts of said first and second pins adapted for connecting a selected

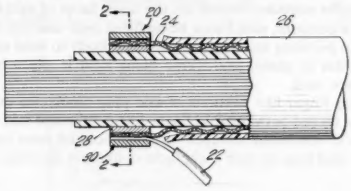
first pin and a selected second pin so that a selected conductive strip of said printed circuit plate is connected to a terminal of a selected component of said connecting device.

3,897,127

MEANS FOR GROUNDING A SHIELDED CABLE

Louis F. Haitmanek, Florham Park, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Mar. 8, 1974, Ser. No. 449,270
Int. Cl.[2] H01R *11/08, 11/20*
U.S. Cl. 339—97 C **3 Claims**



1. Means for joining an external conductor to the sheath of a metallically sheathed cable comprising: a first hollow metallic sleeve member having an inner surface and an outer surface; a second hollow metallic sleeve member having an inner surface and an outer surface, said first sleeve member being arranged to fit coaxially within said second sleeve member while providing a predetermined annular gap therebetween for receiving a portion of the sheath of a metallically sheathed cable within said gap; and insulation piercing sheath engaging means selectively positioned about at least one of said first member outer surface and said second member inner surface; said second sleeve member being compressible about said first sleeve member so as to cause said sheath engaging means to engage such cable sheath portion and an external conductor interposed within said gap to electrically join such external conductor to such cable sheath portion at least through one of said first sleeve member and said second sleeve member upon the compression of said second sleeve member about said first sleeve member, said first sleeve member outer surface having at least one generally longitudinally extending recess arranged to at least partially accommodate a given length of such external conductor therewithin.

3,897,128

PRE-INSULATED CONNECTING DEVICE FOR A PLURALITY OF WIRES HAVING INSULATION DISPLACING FEATURES

Robert Philmore Reavis, Jr., Statesville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

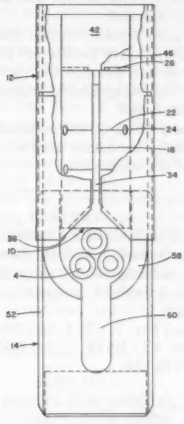
Filed Mar. 25, 1974, Ser. No. 454,182
Int. Cl. H01r *11/20*
U.S. Cl. 339—98 **6 Claims**

1. A connecting device for electrically connecting at least two insulated wires to each other, said connecting device comprising:

a formed tubular metallic terminal member having an axially extending open seam, said seam constituting a wire-receiving and insulation displacing slot extending therein from one end thereof,

a two-part insulating housing comprising a first generally tubular housing part having an open end, said tubular terminal member being concentrically contained in said first housing part with said one end of said terminal member proximate to said open end, said first housing part having a first housing slot extending therein from said open end, said first housing slot being in registry with said wire-receiving slot,

said housing comprising a second generally tubular housing part having an open end which extends into, and is telescopically slidable into, said open end of said first housing part, said second housing part having a wire receiving recess proximate to its open end and having a wire aligning slot extending axially from said recess, said wire aligning slot being in axial alignment with said wire receiving slot and said first housing slot and having a width which is substantially equal to the diameter of one of said wires and a length which is at least equal to the combined



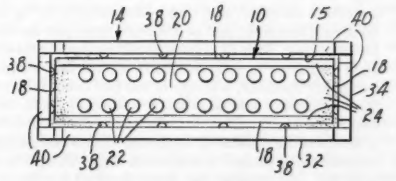
diameters of said wires whereby, upon locating the ends of said wires in said recess and telescopically moving said second housing part into said first housing part, said wires move relatively into said wire aligning slot and upon further movement of said second housing part into said first housing part, said wires will be moved into said wire receiving slot and into said first housing slot whereby the edges of said wire receiving slot penetrate the insulation of said wires and establish electrical contact with the cores thereof.

3,897,129

CONNECTOR ENCAPSULATING DEVICE AND METHOD

John A. Farrar, Jr., Atlanta, Ga., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 26, 1973, Ser. No. 400,951
Int. Cl. H01r *7/04, 13/52*
U.S. Cl. 339—116 C **5 Claims**



1. A method for encapsulating a connector having side walls extending between first and second ends which connector electrically interconnects a plurality of wires projecting from its first end, said method including the steps of:

providing a housing having a socket with a bottom opposite an unrestricted open end, the socket being adapted to closely fit around and completely receive the side walls and second end of the connector with its first end facing the open end of the socket and the wires extending there-

through, said housing having a plurality of projections defining, when a connector is within the socket, passageways extending from the bottom of the socket to the open end, and having a quantity of viscous, water restricting electrically insulating encapsulating material in the socket, the quantity being at least sufficient to fill the socket for a predetermined distance over the connector after the second end of the connector is positioned at the bottom of the socket;

positioning the connector in the socket with its second end adjacent the bottom thereof and in contact with the encapsulating material;

pressing the positioned connector into the open end of the socket with sufficient pressure to force the encapsulating material into and through the passageways to deposit a portion of the encapsulating material at the first end of the connector; and

spreading the portion of the encapsulating material at the first end of the connector around the wires and over the first end of the connector.

3,897,130

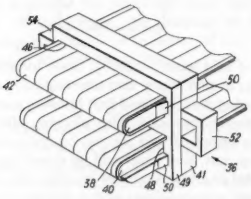
FLAT CABLE CONNECTOR

Robert William Donnelly; Anthony John Damoisiaux, both of Basingstoke, and Raymond George Evans, Kingsclere near Newbury, all of England, assignors to ITT Industries, Inc., New York, N.Y.

Filed Dec. 3, 1973, Ser. No. 421,256

Int. Cl.[2] H01R *13/54;* **H05K** *1/02*

U.S. Cl. 339—176 MF **5 Claims**



4. An electrical connector for flat cable having conductive tracks comprising:

a. plug and receptacle connector members;

b. said plug connector member comprising a generally rectangular one-piece body of an electrically insulating material having a front face and a rear face with two elongated slots extending from said front face to said rear face, each slot being parallel to a first pair of parallel sides of the body, two parallel finger-like portions each having its base between said slots and each projecting forwardly from said front face of said body toward said receptacle connector member, said finger-like portions being parallel to said two slots, and two hooked arms one on each of the other two sides of said body and extending forwardly from said front face of said body toward said receptacle connector member, wherein in use flat cable is threaded through each of said slots and is wrapped around each of said finger-like portions with the tracks of the cable bared at least on the outside of each said finger-like portion, a retainer being placed between said finger-like portions to urge the cable against the inner faces of the finger-like portions, the resilience of the finger-like portions holding the cable in place;

c. said receptacle connector member comprising a generally rectangular one-piece body of an electrically insulating material having a front face and a rear face with two elongated slots extending from said front face to said rear face, each slot being parallel to a first pair of parallel sides of said body, two parallel finger-like portions each having its base between said slots and each projecting forwardly from said front face of said body toward said plug connector member, said finger-like portions being parallel to said two slots and being spaced apart slightly greater than the distance between the opposite facing surfaces of said plug connector member finger-like portions, outwardly-projecting tines on the narrow sides of said finger-like portions, a generally rectangular frame formed with two parallel slots each of which slidably receives one of said finger-like portions when a flat cable is mounted on it, and two lugs one on each of the other two sides of said body, wherein in use flat cable is threaded through said slots on said body and wrapped around each said finger-like portions, the ends of the flat cable then being adjacent to said front face of said body between said finger-like portions, the tracks on the cables being bared at least on the portions thereof on the inner faces of said finger-like portions, said frame being fitted over said two finger-like portions and urged against said body to hold said flat cables in place, said frame being held in place by said tines; and

d. said finger-like portions of said plug connector member are forced between said finger-like portions of said receptacle connector member with said hooked arms engaged in said lugs on said receptacle connector member.

3,897,131

SEALED ELECTRICAL CONNECTING MEANS

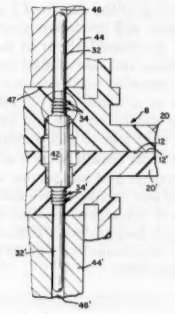
Larry Ronald Stauffer, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 333,241, Feb. 16, 1973, abandoned.

This application May 13, 1974, Ser. No. 469,157

Int. Cl. H01r *9/16*

U.S. Cl. 339—220 R **6 Claims**



6. A sealed multi-contact electrical connector intended for use on a bulkhead, said connector comprising:

a housing comprising first and second housing parts,

each of said parts comprising a body portion having a mating face and a rearward face, a plurality of contact receiving cavities extending through each of said housing parts, each of said cavities having an enlarged portion extending inwardly from said rearward face and having a constricted portion adjoining said enlarged portion,

said first and second parts having said rearward faces against each other with said mating faces facing in opposite directions and with said cavities in axial alignment,

an electrical contact terminal member in each of said cavities, each of said contact terminal members having a central enlarged diameter portion, adjacent sealing portions on each side of said enlarged portion, and a contact portion of reduced diameter at each end thereof extending from said sealing portions,

said enlarged portions of each terminal member being in said enlarged cavity portions of said housings, and said sealing portions being driven relatively into said constricted portions of said cavities and being in sealing

relationship whereby, said connector is sealed between said mating faces.

3,897,132

METHOD AND APPARATUS FOR CORRECTING PYRAMIDAL ERROR IN AN OPTICAL SYSTEM WITH A MIRROR WHEEL

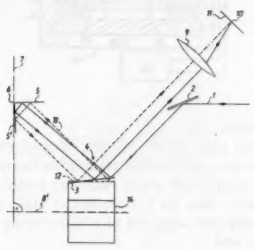
Louis Achilles Meeussen, Mortsel, Belgium; Josef Helmberger, Munich, and Klaus Staddler, Irschenhausen, both of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Germany

Filed Feb. 5, 1974, Ser. No. 439,761

Claims priority, application Germany, Feb. 8, 1973, 2306185

Int. Cl.[2] G02B *17/00*

U.S. Cl. 350—7 9 Claims



1. A method for correcting pyramidal errors in an optical system including a mirror wheel having an axis and a plurality of light-reflective planar surfaces disposed about the circumference of said wheel, each of said planar surfaces being only substantially parallel to said axis and thereby producing respective pyramidal errors, comprising the steps of directing a primary beam of light from a light source onto one of said planar surfaces requiring correction of its pyramidal error so as to produce a first reflected beam; receiving said first reflected beam and at least twice reflecting the latter to direct a second reflected light beam back towards said same one planar surface so as to produce a final reflected beam; and focussing respective ones of said final reflected beams from said planar surfaces at a focal point.

3,897,133

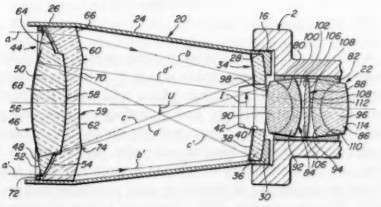
TELESCOPIC OPTICAL SYSTEM

David A. Warner, 100 Memorial Dr., Cambridge, Mass. 02142, and Irving M. Levin, 39 Lewis St., Needham, Mass. 02192

Continuation of Ser. No. 338,102, March 5, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,500

Int. Cl. G02b *23/06*

U.S. Cl. 350—55 13 Claims



1. A catadioptric system comprising:

a concave main mirror having a central light aperture;

a first plural element correcting refractor positioned to intercept and refract light passing to said main mirror from outside said system, said first refractor comprising a first annular positive lens and a second annular negative lens positioned adjacent to said first lens and between said first lens and said main mirror, said first and second lenses being centered on the axis of said main mirror and said second lens being spaced from said main mirror with an air space therebetween;

a second plural element correcting refractor positioned to intercept and refract light reflected from said main mirror and to reflect said light back to said light aperture, said second correcting refractor being positioned centrally of said first refractor and comprising a third negative lens and a Mangin-type secondary mirror, said secondary mirror comprising a fourth positive lens and a concave reflector in contact with said fourth lens, said secondary mirror being positioned so that light reflected from said main mirror will pass through said fourth lens and be reflected back by said concave reflector, said third lens being positioned between said fourth lens and said main mirror so as to intercept and refract light passing to and from said secondary mirror; and

an air space between said third lens and said main mirror; said third lens being made of a material having a different index of refraction than the material of which said fourth lens is made, and said third lens and said secondary mirror coacting to direct light reflected by said reflector back toward said central aperture and being adapted to form an erect real image between said third lens and said main mirror light aperture.

3,897,134

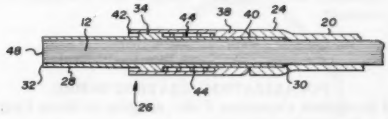
FIBER OPTICS ELEMENT AND DENTAL HANDPIECE CONTAINING THE SAME

Leonard Scrivo, Tuckahoe, and Warren Charles Vetter, Glendale, both of N.Y., assignors to Vicon Products Corporation, Pelham Manor, N.Y.

Filed May 16, 1973, Ser. No. 360,919

Int. Cl. G02b *5/16*

U.S. Cl. 350—96 B 2 Claims



1. A fiber optics element comprising a fiber optics bundle having first and second end portions, each terminating in an optical face, a first tubular guide member disposed about a first portion of said fiber optics bundle, a flexible tubular member disposed about a second portion of said fiber optics bundle disposed adjacent to said first portion thereof, and a plunger assembly comprising a tubular plunger member disposed about a third portion of said fiber optics bundle disposed adjacent to said second portion thereof, said third portion including said second end portion of said fiber optics bundle, said plunger assembly further including a second tubular guide member comprising first and second end portions and being disposed about said tubular plunger member, said plunger member including a stop element disposed between said plunger member and said second tubular guide member, said first end portion of said second tubular guide member being of a diameter such that it cannot pass over said stop element, and said plunger assembly further comprises spring means disposed about said tubular plunger member and between said stop element and said first end portion of said second tubular guide member, and said flexible tubular member includes an overlapping end portion thereof which is disposed about said tubular plunger member such that said second tubular guide member is biased by said spring member into engagement with said overlapping end portion which

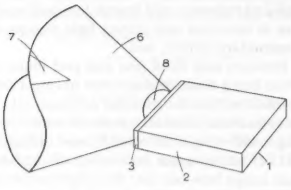
overlapping end portion thus serves as a stop for said second tubular guide member such that said fiber optics element comprises a self-supported plunger assembly whereby the second end portion thereof can be depressed into said second tubular guide member and held under compression.

3,897,135

OPTICAL COMMUNICATIONS SYSTEMS

Richard Burnaby Dyott, London, England, assignor to The Post Office, London, England

Filed July 26, 1973, Ser. No. 382,865
Claims priority, application United Kingdom, July 28, 1972, 35372/72
Int. Cl. G02b *5/14*; **H01s** *3/00*
U.S. Cl. 350—96 C **8 Claims**



1. A method of launching optical energy, from an element including a GaAs laser having one of its reflective surfaces bloomed, into a dielectric optical waveguide including a tapered length terminating in an end section of minimum cross-sectional area, said method comprising the steps of:

a. energizing the element so that it is capable of lasing only when an at least partially reflective surface is placed adjacent said bloomed surface; and

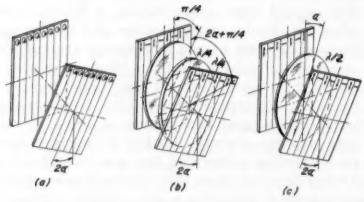
b. positioning the dielectric optical waveguide with its end section of minimum cross-sectional area adjacent the bloomed surface so that lasing action is induced in the element.

3,897,136

POLARIZATION-GRATING MOIRE

Olof Bryngdahl, Cupertino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 9, 1973, Ser. No. 339,676
Int. Cl. G02b *5/30*
U.S. Cl. 350—159 **16 Claims**



1. Apparatus for the formation of moire-fringe patterns comprising a first grating structure having a periodic variation of polarization,

at leat a second grating structure having a periodic variation of polarization positioned in superposition with said first grating structure in a defined optical path, and

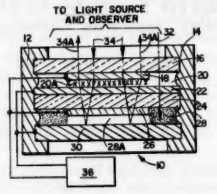
means for illuminating said grating structures whereby a moire-fringe pattern is formed.

3,897,137

DISPLAY DEVICE CONTAINING A LIQUID-CRYSTAL CELL AND A SUSPENDED-CRYSTAL CELL ARRANGED IN SERIES

John P. Dobbins, San Marino, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 28, 1974, Ser. No. 437,594
Int. Cl.[2] **G02F** *1/13*
U.S. Cl. 350—160 LC **13 Claims**



1. In combination,

a liquid-crystal cell, which becomes transformed from a transparent state to a turbid state upon being energized

a suspended-crystal cell which becomes transformed from an absorptive state to a transparent state upon being energized disposed adjacent to and overlying said liquid-crystal cell, and

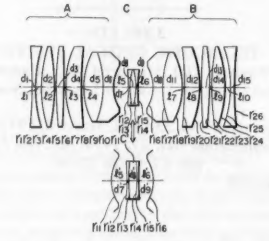
means for selectively energizing each of said cells concurrently to produce a display effect by the combined operation of the respective cells in response to the energizing thereof.

3,897,138

PROJECTION LENS FOR MASK PATTERN PRINTING

Ichiro Kano, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 307,389, Nov. 17, 1972, abandoned. This application Aug. 16, 1974, Ser. No. 498,286
Claims priority, application Japan, Nov. 24, 1971, 46-93709
Int. Cl. G02b *9/64*, *13/24*
U.S. Cl. 350—183 **7 Claims**



1. A projection lens for mask pattern printing comprising a photographic lens arrangement which is interposed between an image plane and an object plane and used for both the alignment and the printing, and including at least one group of fixedly spaced lenses corrected for chromatic aberrations with respect to at least four wavelengths, and a pair of interchangeable lens elements which are interchangeably inserted into said arrangement at identical axial positions therein, one of said interchangeable lens elements being corrected for chromatic aberrations for at least two of said wavelengths and being designed for the alignment and inserted during alignment; the other of said interchangeable lens elements being corrected for chromatic aberrations for at least the other two wavelengths and being designed for the printing and inserted

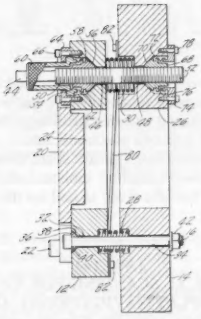
during printing; the axial spacing between said photographic lens arrangement and the image plane remaining the same during both alignment and printing, and the axial spacing between the object plane and the image plane remaining the same during both alignment and printing.

3,897,139

ADJUSTABLE MOUNTING APPARATUS

Antonio B. Caruolo, Vernon, and Allan P. Walch, Manchester, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Apr. 15, 1974, Ser. No. 461,193
Int. Cl. G02b *5/08*
U.S. Cl. 350—288 **12 Claims**



1. Apparatus for adjusting a planar mounting surface, comprising:

a support structure having a conical socket;

a mounting plate positioned adjacent to the support structure and having a conical socket;

a fixed connecting means joining the mounting plate to the support structure including means for spacing apart the mounting plate from the support structure;

a first adjustable connecting means joining the mounting plate to the support structure comprising,

a screw shaft penetrating both the support structure and the mounting plate and having a first screw thread at one end of the shaft and a second screw thread at the other end of the shaft,

a first nut engaging the first screw thread, the first nut having a spherical surface which cooperates with the conical socket in the support structure,

a second nut engaging the second screw thread, the second nut having a spherical surface which cooperates with the conical socket in the mounting plate,

a first bellows attached to the first nut, the first bellows being fixedly positioned with respect to the support structure,

a second bellows attached to the second nut, the second bellows being rotatably positioned with respect to the mounting plate,

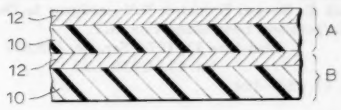
a spring member concentric with the screw shaft and located between the support structure and the mounting plate, the spring member being in compressed state thereby applying a preload to the first and second nuts.

3,897,140

MULTILAYER SOLAR FILTER REDUCING DISTORTIVE DIFFRACTION

Roger W. Tuthill, 11 Tanglewood Ln., Mountainside, N.J. 07092

Continuation of Ser. No. 317,811, Dec. 22, 1972, abandoned. This application June 14, 1974, Ser. No. 479,508
Int. Cl.[2] G02B *5/26, 5/20*
U.S. Cl. 350—314 **13 Claims**



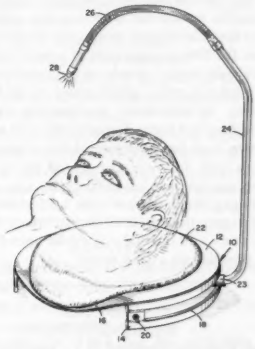
1. A solar filter for an astronomical optical instrument, the solar filter consisting essentially of a plurality of flexible, transparent resin film layers each having a metal coating, the metal coated film layers overlying each other, the film layers having a total thickness not more than approximately 0.002 inch and the metal coatings having a total thickness to provide an opaqueness to allow passage of approximately 0.01 percent sunlight, each of the film layers being of a thinness so that there are pinholes therein, whereby the possibility of a pinhole in one film layer being aligned with a pinhole in another film layer is minimized thus reducing the distortive diffraction effect of said pinholes.

3,897,141

OPHTHALMIC FIXATION DEVICE

Stanley S. Schocket, 3307 Woodvalley Dr., Pikesville, Md. 21208

Filed Sept. 22, 1972, Ser. No. 291,378
Int. Cl. A61b *3/00*
U.S. Cl. 351—36 **15 Claims**



1. An ophthalmic fixation device for examining the eyes of a patient, the device comprising a substantially planar base sized and shaped to enable a patient to rest his head thereon; an elongated rigid supporting arm extending substantially perpendicular to the plane of said base; mounting means for attaching one end of said supporting arm to said base for movement around the periphery of said base in a predetermined arc while at all times remaining perpendicular to the plane thereof; an elongated flexible cable fixed at one end to the end of said supporting arm remote from said base; a light attached to the end of said flexible cable remote from said supporting arm; power means for providing electrical energy to said light; wherein said mounting means attaches said supporting arm to said base in such a manner as to enable said

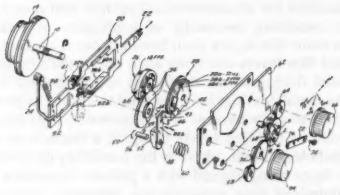
light to rotate above the face of a patient whose head is resting on said base through an arc of approximately at least 270° in a plane substantially parallel to the plane of said base without altering the orientation of said light relative to said supporting arm; and wherein said flexible cable enables said light to complete a full 360° arc above the face of the patient.

3,897,142

MOTION PICTURE PROJECTOR WITH STEP MOTION PROJECTION

Frank E. Ravese, Brooklyn, N.Y., assignor to DeJur-Amsco Corporation, Long Island City, N.Y.

Filed June 13, 1974, Ser. No. 478,897
Int. Cl.² G03B *1/22*
U.S. Cl. 352—194 **13 Claims**



1. In a motion picture projector, a film transport means intermittently operable at a normal run film transport cyclic speed, mechanism for changing the speed of movement of the film driven by said film transport means between (*a*) a film movement corresponding to said normal run cyclic speed and (*b*) a film movement which is less than said normal cyclic speed, said mechanism comprising a first rotatable in-and-out cam member active on said transport means for effecting an in-and-out movement of the transport means for film engagement for the normal run film transport cycle, a second separately rotatable in-and-out cam member active on the transport means for effecting an in-and-out movement of the transport means for film engagement at a speed which is less than said normal run cyclic speed, an up-and-down cam operable at said normal run cyclic speed active on said transport means for effecting up-and-down movements of said transport means, said first and second in-and-out cam members and said up-and-down cam being mounted for rotation about a common axis, a cam follower connected to said film transport means, and mechanism for shifting the said cam follower for selective engagement thereof with said in-and-out cam members for changing the speed of movement of the film transport means between said normal run cyclic speed and a speed less than said normal run cyclic speed.

3,897,143

IMAGING SYSTEM

Leonard M. Carreira, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 12,366, Feb. 18, 1970, Pat. No. 3,791,823, which is a continuation of Ser. No. 808,921, March 20, 1969, abandoned, which is a continuation of Ser. Nos. 677,706, Oct. 24, 1967, abandoned, Ser. No. 677,707, Oct. 24, 1967, abandoned, and Ser. No. 459,860, May 28, 1965, abandoned.
This application Aug. 20, 1973, Ser. No. 389,917
Int. Cl. G03g *15/22*
U.S. Cl. 355—3 P **2 Claims**

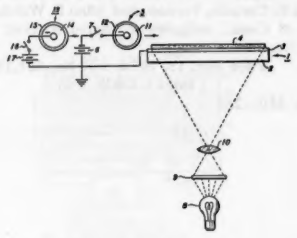
1. Photoelectrophoretic imaging apparatus comprising:

a. a pair of closely spaced apart electrodes at least one of which is partially transparent, said electrodes adapted to have an imaging suspension comprising a mixture of electrically photosensitive particles in a substantially insulating liquid introduced therebetween;

b. means to project a light image on an imaging suspension between and in contact with said electrodes through said partially transparent electrode;

c. means to apply an electric field across an imaging suspension that may be between said electrodes;

d. means to separate said electrodes from said closely spaced relationship leaving an image corresponding to said projected image on one of said electrodes;



e. a transfer sheet comprising a water tackifiable material;

f. means to moisten said transfer sheet with water;

g. means to bring said transfer sheet into firm contact with said image on said one electrode; and

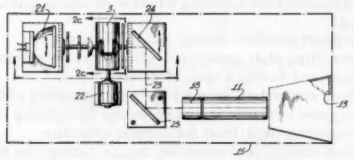
h. means to separate said transfer sheet from said one electrode and remove residual moisture therefrom so that said particles become fixed in and on the surface of said transfer sheet.

3,897,144

MOVABLE OPTICAL SCANNING FOR N-S MOVEMENT IN A MAP DISPLAY NAVIGATIONAL APPARATUS

Terrence Albert Hicks, Stittsville, Canada, assignor to Control Data Canada, Ltd., Ottawa, Canada

Filed Apr. 8, 1974, Ser. No. 458,736
Claims priority, application Canada, June 15, 1973, 174123
Int. Cl.² G03B *21/00, 25/00, 23/00*
U.S. Cl. 353—11 **7 Claims**



1. A navigational apparatus for use in a piloted craft, comprising:

a frame;

a light projector, including means for mounting said light projector for translational movement at one end of said frame, and a display screen mounted at the other end of said frame, having an optical light path therebetween;

a film transport means mounted on said frame, including means for moving a film back and forth longitudinally in a plane perpendicular to light from said projector and in said light path;

a light passing aperture fixedly mounted on said frame in said light path in a plane adjacent and parallel said plane of said film;

optical scanning means and means for mounting said scanning means on said frame in said light path;

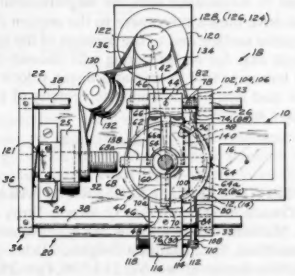
means interconnected between said scanning means and said light projector for effecting synchronous translational movement thereof in a plane parallel with said

movement of said light projector and transversely to said plane of said film to thereby scan across said film; and focussing means between said scanning means and said display screen to focus a film image on said screen.

3,897,145
RECORDING AND SCANNING MECHANISM FOR A SOUND SLIDE PROJECTOR

Morris Schwartz, Plainville, Conn., assignor to Kalart Victor Corporation, Plainville, Conn.

Filed Oct. 1, 1973, Ser. No. 402,168
Int. Cl.² G03B *31/06*
U.S. Cl. 353—19 **16 Claims**



1. A playback and recording assemblage of a sound-slide projector, said assemblage comprising in combination:

a sound-slide including a frame having a first portion defining a window for accommodating therein a transparency to be projected and a second portion constituting a sound track carrier, said carrier being coated on opposite sides with layers of magnetic material for recording thereon sound tracks and scanning said sound tracks; and

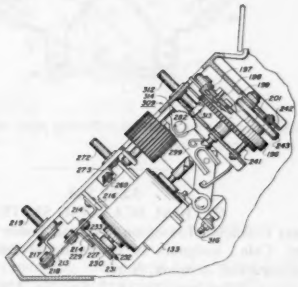
a recording and playback mechanism including a pair of sound heads for recording sound tracks on said layers and scanning recorded sound tracks, carrier means supporting said heads in circumferentially spaced relationship, said carrier means being linearly displaceable and rotatable, each of said heads being movable into and out of a position coacting with one of said layers, reversible first drive means coupled with said carrier means for linearly displacing the same parallel to the magnetic layers between a starting position and an end position, said displacement moving the heads across said layers, rotary second drive means coupled to said carrier means for rotating the carrier means when and while the same are driven from the starting position toward the end position, the combined movements imparted to the carrier means by the first and the second drive means causing the heads to move along predetermined paths relative to said layers, actuating means coacting with said heads for alternately moving the same into and out of coacting relationship with said layers when and while the carrier means are displaced toward the said end portion for respectively reocrding on each of said layers sound tracks corresponding to said paths and scanning sound tracks thus recorded on said layers, and for moving both heads out of coacting relationship with the layers when and while the carrier means are displaced toward said starting position, said actuating means including elastic means for each head, each of said elastic means biasing the respective heads into a position disengaged from the layers, and means coacting with said elastic means for movement of the heads into and out of coaction with the layers at predetermined positions of the heads relative to the layers when and while the carrier means supporting the heads are rotated; and

stationary holder means for releasably holding said slide in a position for said coaction with said heads.

3,897,146
FILM TRANSPORT MECHANISM

Charles E. Smith, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 18, 1970, Ser. No. 73,569
Int. Cl. G03b *21/11, 21/30*
U.S. Cl. 353—26 **22 Claims**



1. Film viewing apparatus comprising;

housing structure;

a viewing screen in one wall of said housing structure;

means for projecting an image onto said screen;

means for supporting film for movement past said projecting means;

differential speed means for imparting movement to said support means for causing movement of said film past said projecting means;

a first reel and drive means therefor;

a second reel and drive means therefor;

motion transfer means operably coupled to said speed differential means for imparting a driving motion to one or the other of said drive means;

said speed differential means comprising a pair of motors and associated output shafts cooperating with means for producing a differential output representative of the difference between the speeds of said motors.

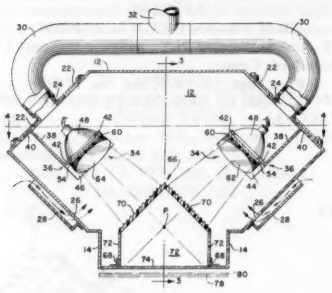
3,897,147
LAMPHOUSE ASSEMBLY FOR PHOTOGRAPHIC PRINTERS AND ENLARGERS

Murray H. Simon, Northglenn, Colo., assignor to Peter Simon, Sumner, Md., a part interest

Filed Mar. 20, 1974, Ser. No. 453,109
Int. Cl.² G03B *27/54, 27/76*
U.S. Cl. 355—37 **11 Claims**

1. A lamphouse assembly for photographic printers and enlargers, comprising first illuminating means for directing light energy in a plurality of different colors, second illuminating means for directing light energy in a plurality of different colors, a closed light mixing chamber having a roof-shaped upper portion formed by two translucent roof panels joined at an angle, a plurality of side portions each having a reflective diffusing interior surface and a bottom portion directly below said upper portion formed by a translucent diffusing plate, first mounting means for aiming said first illuminating means at one of said translucent roof panels and second mounting means for aiming said second illuminating means at the other translucent roof panel, whereby said colors of light are dif-

fused through said translucent roof panels, blended by reflection and diffusion within said mixing chamber and further diffused through said bottom diffusing plate to provide evenly distributed, mixed light.

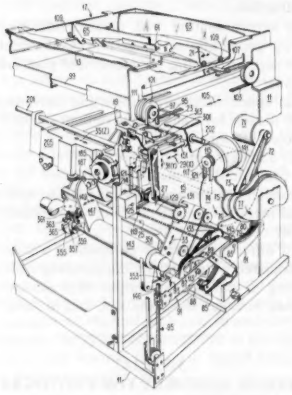


3,897,148

OPTICAL SCANNING SYSTEM

Robert T. Ritchie, Lexington, Ky., and James C. Rogers, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,338
Int. Cl. G03b *27/36*
U.S. Cl. 355—57 **19 Claims**



1. An optical scanning system for scanning a stationary object located on a planar object supporting surface and including a lens for projecting an image of the object to a moving photoreceptive surface moving at a constant velocity, and located at an image plane, said image being projected at a selected one of a plurality of magnifications and wherein the image is located at a fixed position with respect to the image plane regardless of the magnification selected comprising:

a first carriage for supporting a second carriage and positionable with respect to the image plane in at least a first direction to a selected one of a plurality of positions and including at least one guide member positionable therewith;

a second carriage movably mounted on said first carriage for reciprocal motion over a course defined by said guide member and positionable with respect to said first carriage in at least a second direction perpendicular to said first direction to a selected one of a plurality of positions, said second carriage supporting a subcarriage movably mounted thereon, said subcarriage supporting said lens and movable to a selected one of a plurality of positions in at least a third direction perpendicular to said first direction and to said second direction, one of said first, second and third directions being along the optical axis of the lens,

conjugate path compensating means positionable to a selected one of a plurality of positions to maintain the projected image of the object at the same image plane for each of the positions of said lens along its optical axis;

magnification selection control means for selecting one of a plurality of magnification settings;

first drive means responsive to said magnification selection control mean for positioning said first carriage, said second carriage and said conjugate path compensating means in accordance with the magnification selected;

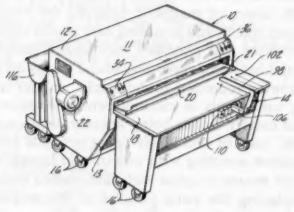
second drive means responsive to the motion of the photoreceptive surface and to the position of the lens along the optical axis for reciprocating said second carriage and said lens over said course at a linear velocity dependent upon said lens position and the velocity of said photoreceptive surface.

3,897,149

PHOTOGRAPHIC EXPOSURE APPARATUS

Barthel Zeunen, Clarkston; Rex C. Grace, Troy, and Alvie R. Dunn, Madison Heights, all of Mich., assignors to Capitol Reproductions, Inc., Madison Heights, Mich.

Continuation-in-part of Ser. No. 213,398, Dec. 29, 1971. This application Feb. 22, 1974, Ser. No. 445,023
Int. Cl. G03b *27/04*
U.S. Cl. 355—97 **18 Claims**



1. An apparatus for making a direct photographic reproduction from a loft drawing and the like, comprising:

a light exposure unit;

a support platform extending into said unit;

a feed system including a drive roller and a driven roller, said drive roller having formed about its periphery a plurality of longitudinally extending lands;

a continuous drive belt movable between said rollers for simultaneously advancing a sheet of film and drawing over said platform through said unit, said system further including means defining an opening to receive the forward edge of the film and drawing;

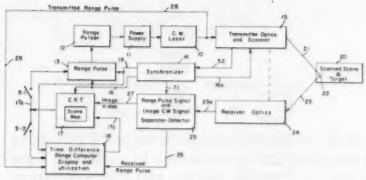
an upper transparent plate in parallel fixed relationship to the platform; and

a lower multiple layer support mounted on the upper surface of said platform for providing a yieldable upward force to maintain the film and drawing together and in driven relationship with the continuous drive belt, said multiple layer support including an intermediate resilient member and an upper layer of relatively low coefficient of friction adapted to facilitate movement of the drive belt over it.

3,897,150
SCANNED LASER IMAGING AND RANGING SYSTEM

William B. Bridges, Thousand Oaks; William O. Edlun, Pacific Palisades, and James C. Hill, Playa Del Rey, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 3, 1972, Ser. No. 240,854
Int. Cl. G01c 3/08
U.S. Cl. 356—5 14 Claims

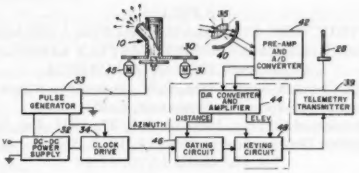


1. In a scanned laser radar imaging system of the type utilizing a gas laser to generate an output of continuous wave radiant energy which is reflected from a scanned scene to produce an image thereof, the improvement comprising:
   a. first means to pulse said laser during predetermined discrete time intervals to vary a characteristic of said laser output during said discrete intervals to thereby produce output pulses distinguishable from said continuous wave output during said time intervals in terms of said varied characteristic;
   b. second means to separate said reflected radiant energy into first and second portions;
   c. third means to utilize said first portion of said reflected energy from said continuous wave output to produce said image of said scene; and
   d. fourth means to simultaneously utilize said second portion of said reflected energy from said output pulses of varied characteristic to determine the range to a predetermined portion of said imaged scene.

3,897,151
LASER MISS DISTANCE INDICATOR

James F. Lecroy, 6406 Charnwood St., Springfield, Va. 22152

Filed Jan. 29, 1973, Ser. No. 329,261
Int. Cl.[2] G01C 3/08
U.S. Cl. 356—5 10 Claims

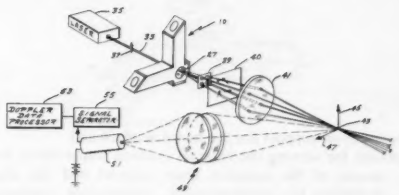


2. A non-cooperative miss distance indicator for measuring and indicating missile-to-target miss distance comprising:
   a clock drive for generating trigger and reference pulses;
   means for emitting a beam of pulsed monochromatic light synchronized with said trigger pulses;
   means for scanning the beam into a hemispherically shaped envelope of radiation around the target;
   means for receiving monochromatic light pulses reflected from the missile and converting them into electrical pulses corresponding to the distance, azimuth and elevation of the missile from the target;
   means for comparing said electrical pulses to said reference pulses to generate distance points; and,
   means for receiving a plurality of distance points and computing the miss distance therefrom.

3,897,152
LASER DOPPLER VELOCIMETER

William M. Farmer, and James O. Hornkohl, both of Tullahoma, Tenn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 4, 1974, Ser. No. 439,663
Int. Cl. G01p 3/36
U.S. Cl. 356—28 1 Claim



1. A laser doppler velocimeter system comprising:
   a. a laser beam source;
   b. means for generating four output light beams from the laser beam with each light beam having a different frequency, the generating means including:
      1. a housing containing first and second intersecting columns of water,
      2. a pair of transparent members on opposite surfaces of the housing at the intersecting points of the water columns for passage of light from the laser beam source,
      3. a pair of Bragg crystals positioned one each in the first and second intersecting columns of water, and
      4. a pair of oscillators having different frequencies activating one each of the pair of Bragg crystals;
   c. a collimating lens intersecting the four output beams to focus upon a test point;
   d. four polarization rotation plates interposed between the beam generating means and the collimating lens with one each of the rotating plates positioned to intercept one each of the output light beams for eliminating predetermined velocity components; and
   e. means for collecting scattered light from the test point including
      1. a lens system intercepting the scattered light from the test point,
      2. a photomultiplier tube positioned to receive the light from the lens system,
      3. a carrier frequency separator fed by the photomultiplier tube, and
      4. a doppler data processor fed by the carrier frequency separator.

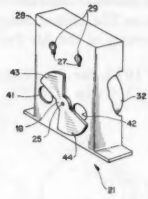
3,897,153
PHASE AND AMPLITUDE BALANCE ADJUSTMENT FOR A DUAL BEAM INFRARED GAS ANALYZER

Charles A. Keenan, Irvine, and Carl N. Cederstrand, Brea, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed July 23, 1973, Ser. No. 382,005
Int. Cl. G01n 21/34, 21/22
U.S. Cl. 356—51 5 Claims

1. In a fluid analyzer of the twin beam type having a pair of beam sources and means for passing one beam through a sample and the other through a standard, a detector for comparing absorption by the standard and the sample, a moving shutter with a pair of vanes for intermittently interrupting the

beams and means for varying the phase relationship between the beams with respect to the time of interruption, the improvement in phase adjustment means comprising:



a common support for the beam sources and

means for varying the relative position transversely to the beams of the common beam support and the shutter mounting for simultaneously, transversely varying the positions of the beams with respect to the shutter mounting.

3,897,154

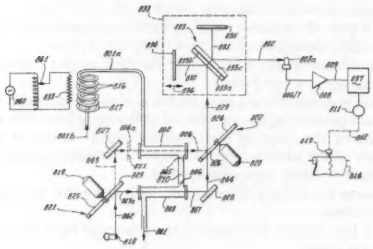
SAMPLE-BACKGROUND AUTOCANCELLATION IN FLUID-SAMPLE ANALYZERS

Roland C. Hawes, 771 Oakglade Dr., Monrovia, Calif. 91016

Filed Nov. 15, 1973, Ser. No. 416,233

Int. Cl. G01n *21/34*; G01j *3/42*

U.S. Cl. 356—51 **17 Claims**



11. A process for determining the constituent makeup of a fluid sample, comprising:

causing the sample to flow through a medium which differentially disperses the constituents in time but which characteristically contains one or more contaminants, such contaminants being subject to gradual emission from the medium in use, whereby the medium adds one or more interfering contaminants to the sample;

subjecting the dispersed sample to substantially continuous spectral analysis at two points along the sample flow path downstream of the dispersive medium;

deriving a combination analysis by combining the spectral analyses from the two points, by a subtractive process so that the effects of the contaminant tend to cancel out while spectral analysis information for the fluid sample is retained in the combination analysis;

and

comparing the combination analysis with known spectral-analysis characteristics of suspected constituents.

3,897,155

ATOMIC FLUORESCENCE SPECTROMETER

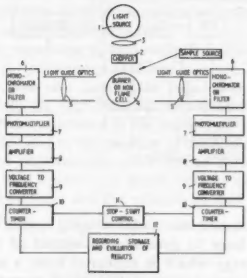
Lloyd Earle Smythe, Paddington, Australia, assignor to Unisearch Limited, Kensington, Australia

Filed Aug. 1, 1973, Ser. No. 384,723

Claims priority, application Australia, Aug. 4, 1972, 9975/72

Int. Cl. G01j *3/38*

U.S. Cl. 356—85 **6 Claims**



1. An apparatus for atomic fluorescence spectrometry in which a true correlation between the output signal and the concentration of an element in a sample under analysis is obtained, substantially free of the effects of scattering, emission and background radiation, comprising:

a. means for producing and modulating a sample light beam and directing the same to atomic vapor containing the element to be analyzed;

b. means for producing an atomic vapor of an element to be analyzed and for receiving said sample light beam;

c. two means, each for receiving and measuring light signals from said atomic vapor, one said means detecting and measuring light intensity at a wavelength at which the element under analysis flouresces, and the other said means detecting and measuring scattered light intensity at a wavelength at which said sample light beam has a strong flux but at which said element does not fluoresce;

d. and means for subtracting from said detected and measured light representing fluorescent and scattered light, the detected and measured light representing scattered light.

3,897,156

STRUCTURE FOR MEASURING THE AVERAGE DIAMETER OF AN APPROXIMATELY CIRCULAR CROSS-SECTION OF AN OBJECT

Leon H. Chasson, Santa Clara, Calif., assignor to Atmospheric Sciences, Incorporated, Sunnyvale, Calif.

Division of Ser. No. 166,418, July 27, 1971, Pat. No. 3,787,700. This application Nov. 14, 1973, Ser. No. 415,565

Int. Cl.[2] G01B *11/10*, *11/28*

U.S. Cl. 356—157 **11 Claims**

7. Structure to produce a measure of the average diameter of a selected, approximately circular, cross-section of an object, which comprises:

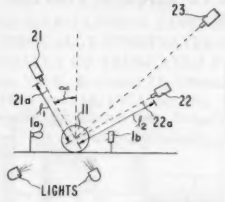
means for producing a first set of signals representing a first diameter of said object at said selected cross-section;

means for producing a second set of signals representing a second diameter of said object at said selected cross-section; and

means for processing said first set of signals and said second set of signals to produce said measure of said average diameter;

wherein said means for producing a first set of signals is oriented substantially perpendicular to said means for producing a second set of signals; and

wherein said means for producing a first set of signals has a first center line, said means for producing a second set of signals has a second center line, and said means for



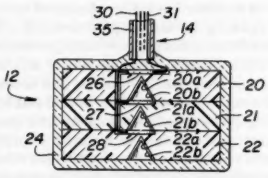
producing a first set of signals and said means for producing a second set of signals are located such that said first center line and said second center line each make an angle of approximately 45° with the vertical.

3,897,157

COLORIMETER FOR FISH LURE SELECTOR

Mano McLaughlin, Geneva, and Andrew M. Wohlert, St. Charles, both of Ill., assignors to Enertron Corporation, Geneva, Ill.

Filed Apr. 11, 1974, Ser. No. 459,912
Int. Cl. G01j *3/48;* **G02b** *5/22*
U.S. Cl. 356—186 **7 Claims**



1. A color analyzer for determining the presence of predetermined colors of light at varying depths in a body of water, comprising

a hermetically sealed housing

a plurality of light responsive photocells mounted within said housing,

each of said photocells having a resistance which varies with the intensity of light impinging thereon,

a plurality of light filters mounted within said housing and each constructed and positioned to direct light from 360° of the ambient onto a respective one of said cells,

each of said cells and the associated one of said filters being selected to provide an electric signal in response to the presence of a respective one of said colors in the ambient light,

a control circuit including visual readout means responsive to electric signals supplied thereto, and

a watertight cable including a plurality of conductors connected between said cells and said control unit.

3,897,158

SIGHTING DEVICE

William F. Steck, III, El Paso, Tex., assignor to W. R. Weaver Company, El Paso, Tex.

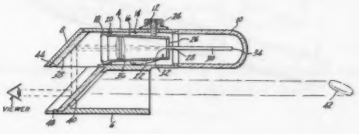
Continuation-in-part of Ser. No. 34,665, May 5, 1970, Pat. No. 3,645,635. This application June 11, 1971, Ser. No. 152,337
Int. Cl.² G02B *23/10*
U.S. Cl. 356—251 **6 Claims**

1. A sighting device comprising:

a. reticle means operative to convert ambient light into a first colored light of a first predetermined relatively narrow wavelength range, said reticle means having an end wall which is illuminated by said first colored light to provide a colored aiming point for said device;

b. transparent means operative to transmit and convert ambient light into a second colored light of a second predetermined relatively narrow wavelength range different from said first wavelength range, said transparent means being arranged to provide a background of said second colored light by which said end wall having said first colored light is surrounded;

c. means providing a field of view in which a target can be sighted;



d. collimating means operative to collimate an image of said aiming point; and

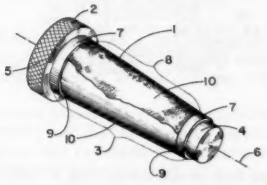
e. image deflecting means including dichroic beam splitter means, said image deflecting means being operative to deflect said image of said aiming point into said field of view, and said dichroic beam splitter means being operative to reflect colored light in said first wavelength range toward a viewer's eye and transmit colored light in said second wavelength range away from a viewer's eye whereby said aiming point appears to a viewer looking at the field of view through said beam splitter means as a colored area in said field of view and said background is not seen by the viewer in said field of view.

3,897,159

MACHINE TOOL TAPER PROTECTION DEVICE

Randell D. Ball, 2122 Statler Dr., Carrolton, Tex. 77713, and Rhoderic D. Buser, 2007 Cedar Ln., Ponca City, Okla. 73160

Filed Dec. 18, 1973, Ser. No. 389,798
Int. Cl. A46b *15/00*
U.S. Cl. 401—9 **6 Claims**



1. A device for temporarily closing, cleaning and lubricating the tapered bore of a machine tool comprising:

a. an elongated generally frusto-conical body means having a first end of larger diameter than a second end, a major portion of the frusto-conical surface being at a radius about 0.02 inches less than that which would be defined by a true frusto-cone based on the balance of said surface;

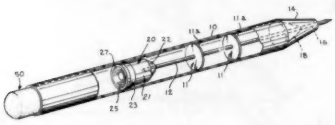
b. a soft oil-absorbing coating comprising an adhesive-bonded floc on at least a portion of said major portion; and,

c. a gripping means attached to said first end, said gripping means comprising a cylindrical enlargement of diameter greater than that of said first end, oriented coaxially with respect to said body means.

3,897,160
PENCIL APPARATUS

Charles J. Chaudoir; True E. Cousins, both of Houston, and Kornel Nagy, Channelview, all of Tex., assignors to Bill B. Berryhill, Bellaire, Tex. and Carlos A. Torres, Houston, Tex., part interest to each

Continuation-in-part of Ser. No. 238,326, March 27, 1972, Pat. No. 3,806,262. This application Sept. 7, 1973, Ser. No. 395,137. The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.
Int. Cl. B43k *21/16*
U.S. Cl. 401—56 10 Claims

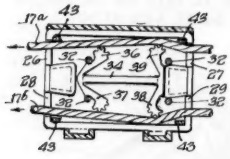


1. A pencil comprising: a flexible tubular barrel; a stick of writing material longitudinally disposed in said barrel; support means within said barrel centrally supporting said stick of writing material therein; and resilient translating means engaging said stick within said barrel responsive to radial deformation forces applied to said barrel around said translating means to axially advance said stick and said translating means through said barrel in one direction only.

3,897,161
ROPE LOCK DEVICE

Ernest William Reinwall, Jr., McHenry, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 16, 1974, Ser. No. 433,777
Int. Cl.[2] F16G *11/04, 11/10*
U.S. Cl. 403—211 19 Claims

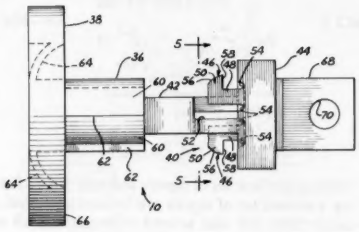


1. A rope lock device comprising: a body having spaced apart top and bottom wall-forming portions and diametrically opposed side wall-forming portions, a first pair of spaced apart apertures formed at one end of said body and a second pair of spaced apart apertures formed at the other end of said body with apertures closest to said side wall-forming portions adapted to receive a length of rope therethrough, a pair of movable arm means positioned within said body and including gripping means to engage the rope and urge the rope firmly against one of said side wall-forming portions at each end of said body and restraining the rope against movement in either direction, and selective release means having a first portion within said body and engageable selectively with said movable arm means, and a second portion extending outwardly of said body to be manually operated to effect selective release of said movable arm means from the rope, whereby the rope can be pulled through said rope lock assembly in either direction.

3,897,162
NONRELEASABLE CONNECTING DEVICE

Steven Havark, 5415 W. Barry, Chicago, Ill. 60641

Filed Nov. 4, 1974, Ser. No. 520,488
Int. Cl.[2] B25G *3/00;* F16D *1/00*
U.S. Cl. 403—353 14 Claims



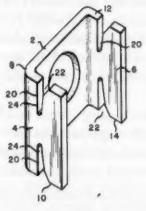
1. A connecting device comprising first and second members, each having elongated shaft means and head means, said members being interconnectable and lockable together;

said first member having an elongated shaft with a number of radially directed surfaces extending along the length thereof, the innermost portion of one radial surface being connected to the outermost surface of an adjacent radial surface by a curved generally continuous surface, said first member having a locking end portion attached to the end of said shaft for connection to said second member; said second member having an elongated split shaft with a central opening therein adapted to receive the shaft of said first member in cooperative engagement and a slot in the head means thereof through which said locking end portion of said first member passes, said second member having recesses on opposite sides of said slot for receiving cooperating portions of said locking end portion when said locking end portion is inserted a predetermined distance and rotated about one fourth turn relative to said second member and moved into locking engagement with said recesses, said rotation causing said first member shaft to radially expand said split shaft of said second member.

3,897,163
WIRE STRAND CONNECTING CLEAT

Stannard D. Holmes, Box 331, Narajito, P.R. 00719

Filed June 11, 1974, Ser. No. 478,257
Int. Cl.[2] F16G *11/00*
U.S. Cl. 403—406 3 Claims



1. A device for connecting the ends of two wire strands or the spaced parts of a single wire strand, comprising a unitary device having a rectangular flat back part having end and side edges, two rectangular flanges extending in the same direction from the side edges of the back part and at right angles thereto and each having end edges aligned respectively with each other and with the end edges of the back part, each of said

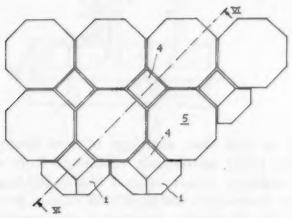
flanges having an inwardly tapered opening therein extending inwardly from each of its end edges to receive a strand of wire.

3,897,164

SYSTEM OF SELF-TAMPING PAVEMENT FORMED BY TWO RECIPROCALLY PENETRATED SETS OF BLOCKS SUBSTANTIALLY OF TRUNCATED PYRAMID SHAPE

Carlo Dodino, Via G. B. Gaulli 21, Genoa, Italy

Filed Nov. 14, 1973, Ser. No. 415,792
Claims priority, application Italy, Nov. 20, 1972, 13022/72
Int. Cl. E01c *5/00*
U.S. Cl. 404—41 **1 Claim**



1. A system of articulated pavement comprised of a pair of sets of identical prefabricated blocks, each block being in the form of a regular octagonal base prism and a square base prism separated by a square base truncated prism having a larger base toward the octagonal base and a smaller base toward the square base prism, the sides of the larger base of said truncated pyramid being equal to twice the apothem of the base of the octagonal prism, the sides of the smaller base of the truncated pyramid being equal to the sides of the base of said octagonal prism, whereby four edges of the larger base of said truncated prism are parallel to and join four faces of said octagonal prism, the trihedrons of the larger base of said truncated prism being removed which extend beyond the vertical secant planes of the four faces of the octangonal prism which are not parallel to edges of the larger base of said truncated pyramid, said square base prism having sides equal to the sides of the smaller base of said truncated pyramid and heights equal to the height of said octagonal prism, one set of said blocks having its octagonal bases extending downwardly and the other set of blocks being arranged with its octagonal bases facing upwardly, the blocks of said sets being inserted one into the other, whereby the upper and lower surfaces of the blocks of one set are parallel with the lower and upper surfaces respectively of the blocks of the other set, the blocks of the two sets being vertically overlapped whereby each square surface of a block at the surface of the pavement is surrounded by four octagonal surfaces of the blocks of the other set and vice versa.

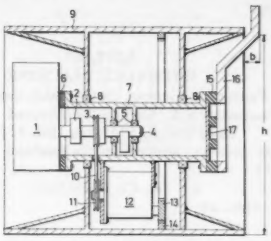
3,897,165

VIBRATORY ROLLER

Gulertan Vural, Emmelshausen, Germany, assignor to Koehring GmbH, Boppard (Rhine), Germany

Filed July 19, 1974, Ser. No. 489,883
Claims priority, application Germany, July 24, 1973, 2337532
Int. Cl.² E01C *19/38*
U.S. Cl. 404—117 **15 Claims**

1. In a ground compacting machine including a vibratory compacting roller having a roller drum, an oscillation exciter located within said roller drum for causing said drum to vibrate, means for driving said oscillation exciter to vibrate said drum, and means for driving said roller drum over the ground to be compacted, the improvement wherein said means for driving said oscillation exciter and said means for driving said roller drum are both located completely within the region enclosed by the periphery and axial extremities of said drum, and include a single common drive motor having an output



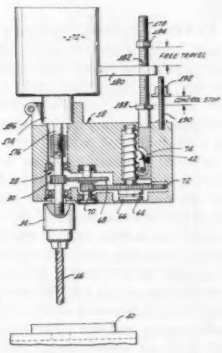
shaft and coupling means operatively connecting said motor shaft to said oscillation exciter and said roller drum.

3,897,166

DRILL FEED CONTROL

Ralph D. Adams, 1210 Portola Ave., Escondido, Calif. 92025

Division of Ser. No. 213,683, Dec. 29, 1971, Pat. No. 3,804,544. This application Apr. 15, 1974, Ser. No. 460,810
Int. Cl.² B23B *47/20*
U.S. Cl. 408—14 **6 Claims**



1. In a drill press for driving a drill bit to bore a hole in a workpiece, said drill press having a stationary spindle housing, and a spindle guide axially slidable therein, a feed control comprising:

a frame attached to said axially slidable spindle guide,

a drive shaft for said drill bit rotatably supported by said spindle guide and journalled in said frame, said drill bit being chucked to said drive shaft,

a lead screw rotatably supported in said frame and being slidably supported therein for limited axial movement without rotation of the lead screw,

a guide shaft axially slidable in said frame parallel to said lead screw,

a stop fixed on said guide shaft and a stationary cooperating reference stop engageable thereby mounted on said drill press in a position fixed relative to said spindle housing to establish an approximate starting position with the tip of the drill in proximity to the workpiece,

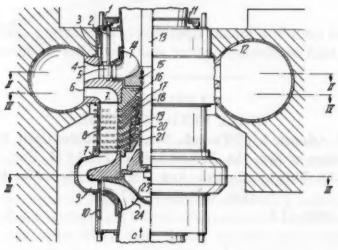
a detent fixed on said guide shaft and engaging the threads of said lead screw to prevent axial advancement of said frame and drill bit in response to axial pressure exerted on the frame, in absence of rotation of the lead screw, and drive means between said drive shaft and said lead screw to cause rotation of said lead screw in response to rotation of the drive shaft, said lead screw cooperating with

said detent means engaged therewith to allow said axial advancement of said frame and said drill bit on said drive shaft to occur under such axial pressure exerted on said frame.

3,897,167
HYDRAULIC MACHINE

Michel Fauconnet, Geneva, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed Dec. 5, 1973, Ser. No. 421,789
Claims priority, application Switzerland, Dec. 14, 1972, 18191/72
Int. Cl. F03b *3/10*
U.S. Cl. 415—95 **6 Claims**



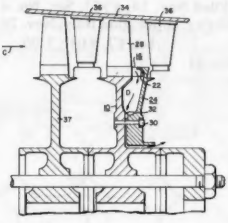
1. In a hydraulic machine, including a frame, a fixed element on said frame, a turbine and a pump each including a wheel, said turbine and pump both shaped for rotation in the same direction, a vertical shaft, said turbine wheel and the pump wheel each connected to said shaft, said turbine including a distributor, said pump including a diffuser, said turbine and pump each including a draft tube, said draft tubes disposed in opposite directions to one another, a single spiral casing connected to the distributor of the turbine and to the diffuser of the pump, valve means permitting the selective separation of the internal space of the spiral casing from the space in which the turbine rotates and the space in which the pump rotates, a bearing for said vertical shaft, said bearing mounted on said fixed element of said frame and disposed between the turbine wheel and the pump wheel whereby only one of said wheels is disposed substantially in the central plane of said spiral casing and the other said wheel is thus spaced apart from said one wheel, direct conduits connecting said spiral casing to said one wheel and reversing conduits longer than said direct conduits connecting said spiral casing to the other wheel for progressive reversal of the direction of the tangential component of flow of the water between the spiral casing and said other wheel, or vice versa.

3,897,168
TURBOMACHINE EXTRACTION FLOW GUIDE VANES

David J. Amos, Wallingford, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 5, 1974, Ser. No. 448,310
Int. Cl. F01d *25/08*
U.S. Cl. 415—144 **5 Claims**

1. An axial flow compressor having a continuous fluid bleed system including:
- at least one rotor disc in said compressor;
- a plurality of generally axially directed grooves on the periphery of said rotor disc;
- an annular array of radially directed airfoil blades supportively disposed in said grooves;
- extraction flow guide vane means attached to the side of said rotor disc, said extraction flow guide vane means comprising generally channel shaped members directed radially inwardly, said channel shaped members being attached to the downstream side of said rotor disc, adjacent the periphery of said disc, and disposed between adjacent turbine blades, said generally channel shaped members having generally parallel leg portions, one leg of each channel shaped member being restrained from dislocation by being attached to a wall of one groove on said disc, the other leg of each of said channel shaped members being attached to an adjacent wall of an adjacent

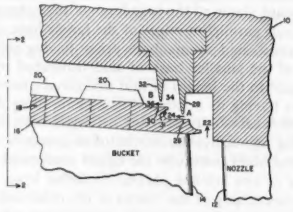


groove on said disc, said legs of said channel shaped members being additionally restrained from dislocation by the wedging action of said blades holding said legs between themselves and said walls of said grooves;
- a coolant flow guide disc attached to the downstream side of said rotor, said coolant flow guide disc guiding the extracted fluid generally radially inwardly adjacent said rotor disc.

3,897,169
LEAKAGE CONTROL STRUCTURE

Jackson E. Fowler, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 19, 1973, Ser. No. 352,569
Int. Cl. F01d *5/20*
U.S. Cl. 415—172 A **6 Claims**



1. An improved leakage control structure for use in the fluid flow path of a turbine comprising:
- a diaphragm including a stationary nozzle ring upstream from an adjacent bucket wheel, the bucket wheel including a plurality of radially extending buckets; the buckets connected at their tip portions by at least one bucket cover circumferentially disposed about the bucket tips;
- a fluid leakage path defined by a pair of axially extending boundaries including the radially outer circumferential surface of the bucket cover and a radially inner, annular diaphragm portion downstream from the nozzle ring;
- first and second axial stepped portions formed on one of the pair of boundaries upstream of the connections and further including an annular radially extending side surface therebetween;
- a first annular fin extending radially from the other of said boundaries toward the first stepped portion and terminating in a tip portion closely adjacent the first stepped portion to form a clearance therebetween;
- a second annular fin extending radially from the other of said boundaries toward the second stepped portion and

terminating in a tip portion closely adjacent the second stepped portion; and,

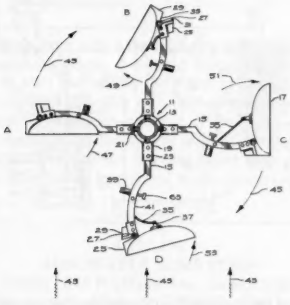
the first and second annular fins axially positioned substantially upstream from the mid-point between the bucket leading and trailing edges.

3,897,170

WIND MOTOR

Arthur Darvishian, 5314 Sheridan Dr., Williamsville, N.Y. 14221

Filed Jan. 9, 1974, Ser. No. 432,031
Int. Cl. F03d *3/06*
U.S. Cl. 416—119 **16 Claims**



1. A self-adjusting wind motor with a wind receptor that moves substantially in a plane of the wind, which automatically presents the wind receptor to the wind in a position of high wind resistance when moving in the direction of the wind and moves it into a position of low wind resistance when moving against the wind, said automatic self-adjustment of position or feathering being caused by the action of the wind and centrifugal force on the receptor, which comprises a rotatable shaft, an arm operatively connected to said shaft and extending from it and a wind receptor of curved or hollowed shape with the open face of the curve or hollow facing the wind in the position of high wind resistance, said wind receptor being held to the arm by pivot means at or near an end of said arm away from the shaft and said arm being of a shape to conform with the shape of the receptor when the receptor is in said position of high wind resistance and against the arm.

3,897,171

CERAMIC TURBINE ROTOR DISC AND BLADE CONFIGURATION

William F. Stahl, Media, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 25, 1974, Ser. No. 482,913
Int. Cl. F01d *5/16*
U.S. Cl. 416—244 **4 Claims**

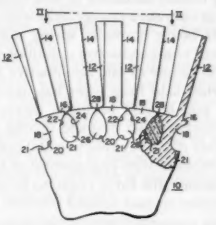
1. A ceramic rotor disc for gas turbines including:

ceramic airfoil blades integral with said ceramic rotor disc; each of said airfoil blades having an airfoil portion on their radially outer section an intermediate platform portion, and an elongated shank portion on their radially inner section,

an elongated cavity being disposed between adjacent blade shanks,

each of said cavities having wall portions, said wall portions being coated with a parting material,

said cavity being filled with a ceramic plug, said ceramic plug serving as a centrifugal force pin to help reduce



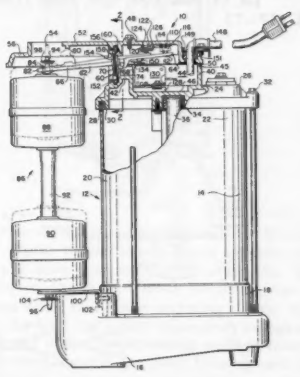
vibratory motion of the airfoil blades during rotor disc rotation.

3,897,172

MOTOR CONTROL ASSEMBLY FOR SUBMERSIBLE SUMP PUMP

Malcolm S. Hall, Fort Wayne, Ind., assignor to Wayne Home Equipment Co. Inc., Fort Wayne, Ind.

Filed Apr. 2, 1973, Ser. No. 347,161
Int. Cl.[2] F04B *49/00*
U.S. Cl. 417—40 **16 Claims**



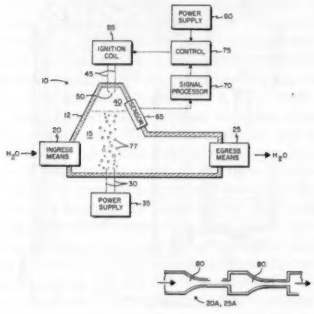
1. In combination with a sump pump submersible in a fluid, the pump including an electric motor having a motor casing and means coupled to one end of said motor for pumping fluid, a fluid level responsive motor control assembly comprising a motor end housing fixedly secured to and closing the end of said motor casing opposite said pumping means, a switch compartment including a peripheral wall formed integrally with said end housing and a compartment closure member secured to said wall and sealably closing said compartment, a float lever having a fulcrum pivotally coupled to said compartment adjacent said peripheral wall and having inner and outer ends extending inwardly and outwardly of said compartment, respectively, means coupled to said outer float lever end for pivoting said float lever between first and second positions in response to a fluid level, a first magnetic element coupled to said inner float lever end, a second magnetic element coupled to said closure member in vertical registry with said first magnetic element, said first and second magnetic elements being magnetically and physically engaged when said float member is adjacent said first position thereof and being disengaged when said float lever is adjacent said second position thereof, switch means for electrically connecting and disconnecting said motor to and from a source of electrical energy, said switch means having at least one operating lever and two

simultaneously operable sets of switch contacts and being operative between conductive and non-conductive conditions in response to movement of said switch lever, said switch means being fixedly mounted in said compartment with said switch lever in operative engagement with said inner end, said switch means being normally spring biased to one of said conductive and non-conductive conditions, said switch means being operable to one of said con-ductive and non-conductive conditions when said float lever has moved a distance from said first to said second positions thereof just sufficient to physically disengage said first and second magnetic elements, and to the other of said conductive and non-conductive conditions in synchronism with engagement of said first and second magnetic elements, the force required to move said lever from said first position to said second position being increased by said physically engaged magnetic elements until said magnetic elements are separated whereby said lever is maintained in said first position by magnetic field interaction of said magnetic elements and the magnetic force developed thereby until said fluid level has changed sufficiently to produce a change in the buoyant force of said means which exceeds said magnetic force.

3,897,173
ELECTROLYSIS PUMP

Harold Mandroian, 2137 Los Amigos, La Canada, Calif. 91011

Filed Mar. 22, 1973, Ser. No. 343,658
Int. Cl. F04f *1/16, 7/10;* **F04b** *21/00*
U.S. Cl. 417—73 **11 Claims**



1. A pump comprising:

a substantially enclosed chamber, said chamber having ingress and egress means for a substance to be pumped, said ingress means having means to restrict egress of said substance from said chamber including

a tube communicating between the interior of said chamber and a source of said substance external to said chamber, at least a portion of said tube having progressively decreasing internal cross-sectional area along the direction from said source to said interior and said egress means having means to restrict ingress of said substance into said chamber;

a volume of water containing at least a trace amount of ionized impurity in said chamber;

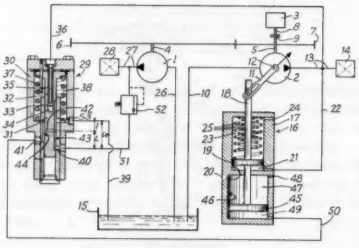
alternating current means for electrolyzing said water within said chamber, whereby gaseous hydrogen and oxygen are formed from a portion of said water within said chamber; and

means for igniting the hydrogen in the presence of the oxygen, within said chamber, whereby an explosion ensues causing at least a portion of said substance within said chamber to be forcibly ejected from said chamber through said egress means, whereupon, when said explosion subsides, a partial vacuum is created within said chamber causing additional of said substance to be drawn into said chamber through said ingress means.

3,897,174
DEVICES FOR FEEDING FLUID UNDER PRESSURE TO AT LEAST TWO LOAD CIRCUITS

Michel F. Capelle, and Claude Pinson, both of Senlis, France, assignors to Societe Anonyme: Poclain, Oise, France

Filed Apr. 29, 1974, Ser. No. 464,840
Claims priority, application France, May 28, 1973, 73.19331
Int. Cl.² F16D *31/02;* **F04B** *49/00*
U.S. Cl. 417—216 **5 Claims**



1. A device for feeding fluid under pressure to at least two load circuits, comprising:

two groups of pump means for feeding fluid to a respective one of said load circuits and each including a pump, a driving shaft and a delivery pipe, one of said groups of pump means being constant-flow and the other of said groups being variable-flow,

flow control means associated with said variable-flow group.

driving motor means having a single output shaft to which are coupled the driving shafts of said pumps,

power regulator means including a body and an element movable with respect to the body and which is coupled between the flow control means and the body of said variable-flow group of pump means, said regulator including ram means interposed between said body and said movable element of said regulator and comprising an inlet chamber,

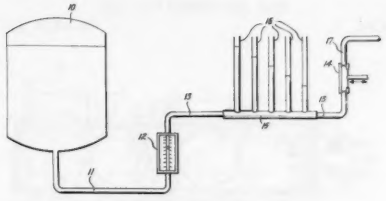
pipe means connecting the delivery pipe from said constant-flow group of pump means to said inlet chamber, and

a valve arranged in said connecting pipe means and comprising a body, a slide movably mounted in said body, an inlet connected to said delivery pipe by said connecting pipe means, two outlets of which a first outlet is connected to a fluid tank and the second outlet is connected to said inlet chamber of said ram means by said connecting pipe means, a fluid connection for control of the position of said slide, said fluid connection being connected to the delivery pipe of said variable-flow group of pump means, and a passage between said body and said slide of said valve at least one of the dimensions of which varies as a function of the position of the said slide in said body, said inlet, said first outlet and said second outlet being in permanent communications with said passage, said second outlet communicating with said passsge at a region intermediate communication of said inlet and said first outlet with said passage, and the portion of said passage lying between the regions of communication of said inlet and said second outlet with said passage forming a variable fluid constriction.

3,897,175
DAMPER APPARATUS

Abdullah M. Rokadia, Schaumberg, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Sept. 21, 1973, Ser. No. 399,671
Int. Cl. F04b *11/00*
U.S. Cl. 417—313 **5 Claims**

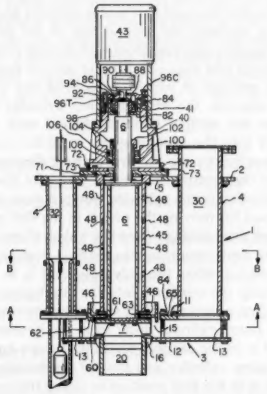


1. In combination with a liquid supply and a pulsating positive displacement pump, a conduit connected to said liquid supply at its inlet end and to the pump at its outlet end, said conduit carrying a plurality of upstanding open-ended tubes communicating with said conduit at their lower ends and extending upwardly to contain the liquid flowing in said conduit when said pump is not drawing liquid through said conduit, and a flow meter interposed in the liquid supply to said conduit.

3,897,176
ADJUSTABLE SUMP PUMP

George B. Emeny, 575 Highland Ave., Salem, Ohio 44460

Continuation-in-part of Ser. No. 248,819, May 1, 1972, Pat. No. 3,764,237, which is a continuation-in-part of Ser. No. 213,348, Jan. 17, 1972, Pat. No. 3,737,255. This application Oct. 9, 1973, Ser. No. 404,786. The portion of the term of this patent subsequent to Oct. 9, 1991, has been disclaimed.
Int. Cl.[2] F04B *35/04*
U.S. Cl. 417—359 **3 Claims**

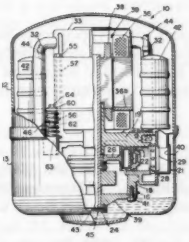


1. A pump for removing liquid from a pit comprising:
means for covering at least a portion of the pit and for providing a base;
a casing defining a pumping chamber for being disposed within the pit;
means depending from the covering means for supporting the casing defining a pumping chamber within the pit; an overhung impeller shaft extending downwardly through openings in the covering means and in the top of the pumping chamber;
an impeller attached to said shaft and positionable within the pumping chamber;
a motor mounted above the covering means for turning the impeller shaft and impeller;
a protection column surrounding the impeller shaft and positioned thereabout;
plate means secured to the bottom of the protection column providing an upper wear surface for the impeller; means for sealing the column to the pumping chamber without restricting the vertical movement of the column; and
means for adjusting the vertical position of the impeller shaft and impeller relative to the protection column; and means for adjusting the position of the protection column relative to the covering means.

3,897,177
COMPRESSOR CONSTRUCTION

Sidney A. Parker, Fort Worth, Tex., assignor to Lennox Industries Inc., Marshalltown, Iowa

Continuation of Ser. No. 223,437, Feb. 4, 1972, abandoned. This application Oct. 29, 1973, Ser. No. 410,821
Int. Cl. F04b *17/00*
U.S. Cl. 417—363 **7 Claims**



1. A hermetic compressor comprising an outer housing, a body defining cylinder means, piston means disposed in said cylinder means, a drive shaft operatively connected to the piston means for moving same, a motor secured to the drive shaft for rotating same, said motor including a stator operatively affixed to the body and a rotor operatively connected to the drive shaft, the motor incorporating resilient mounting means for supporting same in the outer housing, said stator comprising a plurality of laminates secured to one another, said mounting means comprising a laminate formed integral with said stator, the plane of said laminate being above or substantially the same as the center of gravity of the body and aligning means for aligning the stator on the body disposed between the stator and the body.

3,897,178
PUMPING SYSTEM

Herbert Palloch, Schwetzingen, Baden, Germany, assignor to Frankl & Kirchner, Schwetzingen/Baden, Germany

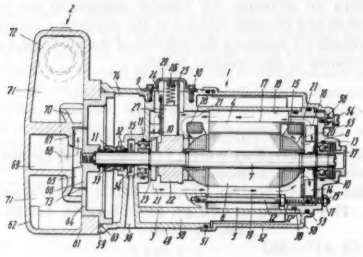
Filed Sept. 10, 1973, Ser. No. 396,103
Claims priority, application Germany, Sept. 9, 1972, 2244275
Int. Cl.[2] F04B *39/06*
U.S. Cl. 417—368 **6 Claims**

1. In a pumping system comprising a commutator motor having a housing, a shaft, a commutator, carbon brushes and bearing end-covers at the pump side and the opposite side thereof, a pump directly driven by said motor, a cooling jacket formed at least in part by a double-walled design of said motor housing surrounding substantially the entire periphery of said motor, filling means for filling said cooling jacket with the liquid to be pumped when in use, said motor being completely sealed from said cooling jacket, and ventilator means includ-

ing a ventilator mounted on said shaft for forcing air circulation at the center of said motor, the improvements wherein:

said pump-side bearing end-cover is surrounded by said cooling jacket;

said commutator is mounted in the region of said pump-side bearing end-cover;



said motor housing has covers therein for outwardly shielding the carbon brushes of said commutator; and

said ventilator is mounted in the region within the bearing end cover which is opposite to that at the pump-side.

3,897,179

PUMPING UNIT FOR LIQUIDS

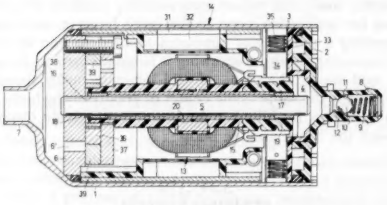
Paul Fussner, Sindelfingen, and Hermann Nusser, Asperg, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 11, 1974, Ser. No. 432,741

Claims priority, application Germany, Mar. 10, 1973, 2312024

Int. Cl. F04b *17/00*

U.S. Cl. 417—423 R **7 Claims**



1. In a pumping unit for liquids, particularly for liquid fuels, a combination comprising a housing; a pump in said housing; an electromotor in said housing and connected with said pump for driving the same, said electromotor comprising a stationary shaft, a sleeve surrounding said shaft and being turnable relative to the same, said sleeve having opposite axial end portions, each provided with a recess in an inner circumferential surface of said sleeve, an armature mounted on said sleeve, and a collector also mounted on said sleeve; and a pair of journals, each received in one of said recesses and journalling said sleeve on said shaft, said journals being of sintered material and being press-fitted into the respective recess and having respective inner diameters slightly smaller than the inner diameter of said sleeve so that the latter surrounds said shaft with a slight clearance.

3,897,180

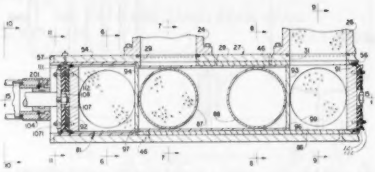
CONCRETE PUMPING MACHINE

Gerald H. Reinert, 6 Brightwood, Cold Spring, Ky. 40819

Continuation-in-part of Ser. No. 334,050, Feb. 20, 1973, abandoned. This application June 18, 1974, Ser. No. 480,468

Int. Cl. F04b *17/04, 35/04, 15/02*

U.S. Cl. 417—517 **4 Claims**

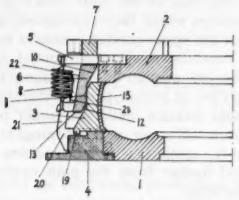


1. A concrete pump which comprises an elongated hollow valve housing, there being a pair of spaced upright conduits attached to an upper panel of the housing and communicating with the inside of the housing, a pair of pump cylinders attached to a side panel of the housing and communicating with the inside of the housing, and a pair of spaced discharge lines attached to an opposed side panel of the housing and in communication with the inside of the housing, each of the pump cylinders and each of the discharge lines being aligned with one of the upright conduits, a valve element reciprocably mounted inside the housing, said valve element including a pair of transversely extending tubes and a pair of guide chambers, each of said guide chambers having an upper inlet and a side opening, outer walls of the guide chambers forming end walls of the valve element, means for moving the valve element between a first position at which a first one of the guide chambers is opposite a first one of the pump cylinders and guides concrete from the upright conduit aligned with said first pump cylinder into said first pump cylinder and a first one of the tubes is opposite the second one of the pair of pump cylinders and guides concrete from said second pump cylinder into the discharge line aligned with said second pump cylinder and a second position at which the second one of the guide chambers is opposite the second pump cylinder and guides concrete from the upright conduit aligned with the second pump cylinder into the second pump cylinder and a second one of the tubes is opposite the first pump cylinder and guides concrete from the first pump cylinder into the discharge line aligned with the first pump cylinder, pump pistons in the pump cylinders, means for moving the piston in the first pump cylinder away from the housing when the valve element is in the first position to draw concrete into the first pump cylinder and toward the housing when the valve element is in the second position to pump the concrete into the discharge line associated with the first pump cylinder, means for moving the piston in the second pump cylinder away from the housing when the valve element is in the second position to draw concrete into said second pump cylinder and toward the housing when the valve element is in the first position to pump the concrete into the discharge line associated with the second pump cylinder, the means for moving the valve element including a hydraulic cylinder, means for mounting the hydraulic cylinder on the housing at an end thereof, a piston rod actuated by said hydraulic cylinder and attached to one of the end walls of the valve element for moving the valve element between the first and second positions, and seal elements mounted on the end walls of the valve element to resist passage of concrete outwardly of the end walls, there being openings in the valve housing outboard of the valve element for discharge of concrete which passes the end walls.

3,897,181
VULCANISING MOULD FOR PNEUMATIC VEHICLE TYRES

Erich Madaschefsky, Vienna, Austria, assignor to Semperit Aktiengesellschaft, Vienna, Austria

Filed Jan. 14, 1974, Ser. No. 433,143
Claims priority, application Germany, Jan. 11, 1973, 2301310
Int. Cl.[2] B29H 5/02, 5/08
U.S. Cl. 425—47 3 Claims



1. A vulcanising mould for pneumatic vehicle tyres, comprising a first mould part, a second mould part, a plurality of peripheral segments disposed between said first and second mould parts for forming the tread of the tyre, said first mold part being positionally oriented to cooperate with said second mould part and said plurality of peripheral segments, a closing ring operatively connected to said first mould part, said closing ring including inner conical surface means for radially moving said peripheral segments, a plurality of tension springs supported by said first mould part and said closing ring, said closing ring being movable against the action of said plurality of tension springs in a direction which causes said peripheral segments to move towards one another, sliding components which are radially movable for operatively connecting the peripheral segments to the second mould part, said sliding components including means for ensuring that when the vulcanising mould is being opened the peripheral segments are moved radially outwards and when the vulcanising mould is opened the peripheral segments remain on the second mould part, said tension springs being disposed at the outside of the vulcanising mould, said first mould part and said closing ring in the open condition of the vulcanising mould and during closing of the vulcanising mould contacting one another to thus provide for direct heat transfer to said first mould part.

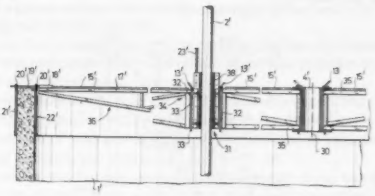
3,897,182
SLIP FORM APPARATUS FOR CONSTRUCTING CIRCULAR STRUCTURES

Otto Heinzle, Sonderberg 19, 6840 Gotzis (Vorarlberg), Austria

Filed Oct. 12, 1973, Ser. No. 405,880
Claims priority, application Austria, Oct. 13, 1972, 8812/72
Int. Cl. B28b 1/14
U.S. Cl. 425—63 9 Claims

1. A mold arrangement for pouring a concrete mixture comprising:

a. a plurality of upright columns;
b. a plurality of sleeve members;
c. an annular frame,
   1. said sleeve members being mounted on said frame in circumferentially spaced relationship and slidably receiving said columns respectively;
d. a plurality of elongated beam members;
e. fastening means releasably fastening one longitudinal end portion of each beam member to said frame in a position in which the direction of elongation of each beam member is substantially horizontal and outwardly away from said frame;
f. a mold assembly including a plurality of upright sheet members jointly constituting an outer mold wall and an inner mold wall respectively remote from and near said frame and spaced from each other in said direction;
g. securing means releasably securing respective portions of each of said walls to the other longitudinal end portions of said beam members, the secured walls depending from

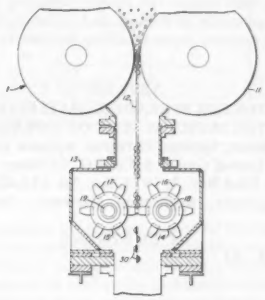


said beam members and holding said other end portions in transversely spaced relationship; and
h. means for holding said sleeve members in predetermined vertical positions on said upright columns and for thereby transmitting a portion of the weight of said frame and of said mold assembly to each of said columns.

3,897,183
BRIQUETTE MOLDING APPARATUS AND BREAKER

Gottfried Hofmann, Lutzelfuh-Goldbach (BE), Switzerland, and Frank Kennedy, Mount Lebanon Twp., Allegheny County, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 31, 1972, Ser. No. 240,085
Int. Cl. B29c 3/02
U.S. Cl. 425—78 4 Claims



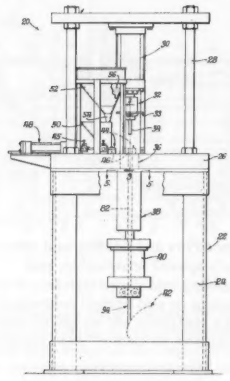
1. In a briquetting machine including roller presses that form sheets of briquettes, the improvement which comprises: at least two impacting devices, located adjacent to the sheet exit of said machine and arranged opposite to each other along the length of said exit,

each of said devices having one or more impact means,
each of said means being adapted to apply impact forces at the plane of each sheet, and
movement control means to bring the impact means of the opposed devices into parallel overlapping relationship with each other at the plane of the sheet exit and spaced from each other a distance corresponding to the distance between parallel briquette pockets in the briquetting machine.

3,897,184
APPARATUS FOR MAKING BARS FROM POWERED METAL

James Woodburn, Jr., Wheaton, and Gordon Russell Lohman, Glen Ellyn, both of Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Mar. 7, 1974, Ser. No. 448,819
Int. Cl. B29c *3/00*; B30b *11/06*, *15/22*
U.S. Cl. 425—79 2 Claims

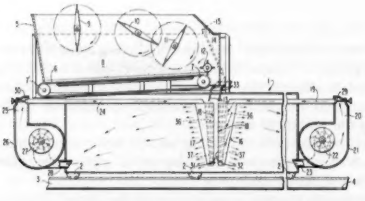


1. A press for continuously forming continuous bar comprising a die having a cavity, means for introducing a selective amount of powdered metal into the die cavity, a ram and punch reciprocable toward and from the die, lengthwise spaced limit means engaged by the ram for controlling and reversing the movement of the ram in response to engagement by a respective one of the limit means, the ram being operative on advance stroke to move the punch into the die cavity, the engagement of the punch with the powdered metal in the die cavity developing reaction pressure, and means for relocating one of said limit means and thereby adjusting the length of each advance stroke of the ram and punch in direct proportion to said reaction pressure during that stroke.

3,897,185
APPARATUS FOR SPREADING MATERIAL SERVING FOR THE MANUFACTURE OF FIBERBOARDS

Reinhardt Beyer, Springe, Germany, assignor to Bison-werke Bahre & Greten GmbH & Co. KG, Germany

Filed Nov. 7, 1973, Ser. No. 413,424
Claims priority, application Germany, Nov. 7, 1972, 2254501
Int. Cl. B29j *5/00*
U.S. Cl. 425—81 30 Claims



1. Apparatus for spreading a mixture of superfine, fine and coarser particles onto a particle carrier for subsequent press-forming into fiberboards and the like; said apparatus comprising:

particle supply means spaced vertically from said particle carrier and including means for supplying a heterogeneous mixture of superfine, fine and coarser particles to said particle carrier such that said mixture falls downwardly towards said particle carrier with a particle path centerline extending downwardly from said particle supply means to said particle carrier;

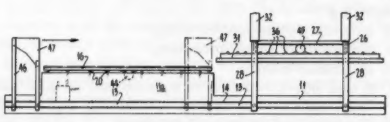
upper particle classifying means disposed between said particle supply means and said particle carrier and including a plurality of upper conduit means at each of opposite lateral sides of the path centerline, the upper conduit means at one side of the path centerline having upper outlet openings which face corresponding upper outlet openings of the upper conduit means at the other side of the path centerline, said upper outlet openings being spaced from one another in a direction transverse to said path centerline to permit passage therebetween of portions of said mixture while gas under pressure is discharged from said upper outlet openings to effect a classification of the particles with the superfine and fine particles spaced further from the path centerline than the coarser particles;

lower particle classifying means disposed between said upper particle classifying means and said particle carrier and including a plurality of lower conduit means at each of said opposite lateral sides of the path centerline, the lower conduit means at one side of the path centerline having lower outlet openings facing in one direction away from the path centerline and the lower conduit means at the other side of the path centerline having lower outlet openings facing in an opposite direction away from the path centerline, said lower outlet openings at the one side of said centerline path being spaced from the lower outlet openings at the other side of the centerline path to form a space therebetween for the passage therethrough of a portion of the particle mixture without further classification by said lower particle classifying means while other portions of the particle mixture pass outwardly of said lower outlet openings and are further classified by gas under pressure exiting from said lower outlet openings, whereby boards can be constructed with that portion of the particle mixture which is classified only by the upper classifying means forming central board sections and that portion of the particle mixture which is classified by both the upper and lower classifying means forming edge board sections.

3,897,186
APPARATUS FOR MAKING REINFORCED CEMENT PANELS

James Douglas Farfor, Brighton, Australia, assignor to Fictor Pty. Limited, Australia

Filed Jan. 17, 1974, Ser. No. 434,239
Claims priority, application Australia, Jan. 17, 1973, 1939/73; Mar. 6, 1973, 2495/73
Int. Cl. B28b *1/08*
U.S. Cl. 425—85 8 Claims



1. Apparatus for producing reinforced cement panels comprising a fixed lower mould, slurry depositing means for applying a layer of slurry to the lower mould, an upper mould having a lower surface shaped complementarily to the upper surface of the lower mould, means for moving the upper mould between one position in which it is above the lower mould and a second position in which it is remote from it, and

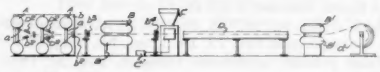
means for applying suction through the upper mould to the lower surface thereof.

3,897,187

APPARATUS FOR THE CONTINUOUS PRODUCTION OF LAMINATED ELECTRIC CONDUCTORS

Leon Mole, Lancaster, England, assignor to Greengate Cables Limited, Manchester, England

Continuation-in-part of Ser. No. 198,979, Nov. 15, 1971, abandoned. This application Aug. 13, 1973, Ser. No. 387,628
Int. Cl. B29f *3/10*
U.S. Cl. 425—90 **4 Claims**



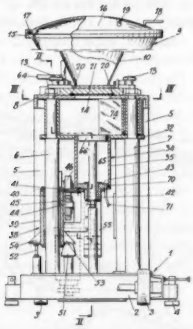
1. Apparatus for the continuous production of an insulation coated laminated metal electrical conductor assembly comprising means for continuously drawing flat metal conductor strips from a series of supply packages and assembling the strips one above the other with coextensive surfaces in electrically conductive contact, means for applying an electrically conductive lubricant to said surfaces between said strips for allowing relative movement between said strips in the assembly, means for coating the moving strip assembly by continuously extruding thereabout and therealong a surrounding continuous covering of electrically insulating material, means for setting said covering on the moving strip assembly, and means for winding the coated laminated conductor assembly into coil form.

3,897,188

VOLUMETRIC DIVIDER FOR PASTE, ESPECIALLY FOR DOUGH PASTE

Georges Aime Marchand, 16, rue Mac-Mahon, Rueil-Malmaison, Hauts de Seine, France

Filed Sept. 24, 1973, Ser. No. 399,700
Claims priority, application France, Mar. 29, 1973, 73.1147
Int. Cl.[2] A21C *5/00*
U.S. Cl. 425—238 **10 Claims**



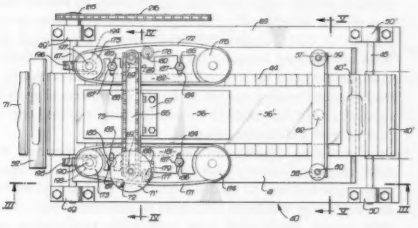
1. A machine for volumetrically dividing dough, comprising:
- a housing for the dough, said housing having an outlet;
- a shutter-cutter adjacent said outlet for controlling said outlet;
- a table supporting said housing adjacent said outlet;
- a plate spaced from and parallel to said table to form a clearing-out passage between said table and said plate;
- a mobile dividing head comprising a vertically oriented cylinder forming an alveolus for containing a predetermined volume of the dough, said cylinder being vertically movable through a hole in said plate into said clearing-out passage;
- a driving mechanism supporting said driving head and having a reciprocal vertical motion for driving said cylinder into and out of said clearing-out passage;
- a pipe for connecting said cylinder to a vacuum source;
- a free piston within said cylinder having a piston rod extending out of said cylinder;
- a fixed stop engageable with said piston rod for determining a low rest position for said piston when said cylinder is out of said clearing-out passage;
- a mobile adjustable stop coupled to said driving mechanism and engageable with said piston rod for determining the position of said piston when said cylinder is in said clearing-out passage; and
- a transfer mechanism comprising an ejector drive coupled to an ejector blade, said ejector blade being positionable within said clearing-out passage and moveable by said ejector drive, whereby a predetermined volume of dough can flow utilizing a pressure differential from the vacuum source from said housing into said alveolus when said cylinder is in said clearing-out passage and said dough can be transferred from between said clearing-out passage to a loading conveyor by said ejector blade when said cylinder is out of said clear-out passage.

3,897,189

APPARATUS FOR FORMING TOROIDS

Daniel T. Thompson, Pacific Palisades, Calif., assignor to Thompson Bagel Machine Manufacturing Corporation, Los Angeles, Calif.

Filed Jan. 10, 1974, Ser. No. 432,302
Int. Cl. A21c *3/00*
U.S. Cl. 425—324 R **21 Claims**



1. In an apparatus for forming individual batches of pliant material, such as dough from a dough divider into toroids of said dough wherein said apparatus includes strip preforming and feeding means for preforming said batches into individual preformed strips of dough and feeding said preformed strips to strip transport and feed means whereby said preformed strips are received one at a time at a predetermined rate from said strip preforming and feeding means and conveyed individually to toroid forming means where said conveyed strips are formed into toroids of said dough, and drive means associated with both said toroid forming means and said strip transport and feed means for conveying said strips longitudinally to said toroid forming means at a rate coordinated with the rate of operation of said toroid forming means, the improvement which comprises:
- means associated with said strip preforming and feeding means for accepting individual batches of said dough from said dough divider at a discharge location;
- transport means associated with strip preforming and feeding means for transporting said batches from said dis-

charge location to said strip transport and feed means, said transport means including a conveyor having a generally horizontal surface thereon for receiving said batches of dough;

strip preforming means associated with said transport means for preforming said batches into generally cylindrical strips of dough having a predetermined length and diameter while transporting said batches from said discharge location to said strip transport and feed means, said preforming means including a pressure plate having a generally horizontal surface spaced above the surface of said conveyor;

moving sidewall means associated with at least a portion of said transport means engaging each end of said strips being transported along said transport means for assisting in the transport of said strips therealong and eliminating drag thereon, said moving sidewall means including a pair of spaced conveyor belts disposed on each side of the upper surface of said conveyor remote from said discharge location and adjacent said strip transport and feed means, said belts having surfaces thereon extending generally normal to the surface of said conveyor;

conveyor adjusting means associated with said conveyor belts for adjusting the spacing between the surfaces thereof; and

drive means associated with both said moving sidewall means and said transport means for driving both said sidewall means and said transport means in the same direction, said drive means including means associated therewith for moving said conveyor belts at a speed generally about one-half that of the speed of said conveyor.

4. In an apparatus for forming individual batches of pliant material, such as dough from a dough divider into toroids of said dough wherein said apparatus includes strip preforming and feeding means for preforming said batches into individual preformed strips of dough and feeding said preformed strips to strip transport and feed means whereby said preformed strips are received one at a time at a predetermined rate from said strip preforming and feeding means and conveyed individually to toroid forming means where said conveyed strips are formed into toroids of said dough, and drive means associated with both said toroid forming means and said strip transport and feed means for conveying said strips individually to said toroid forming means at a rate coordinated with the rate of operation of said toroid forming means, the improvement which comprises:

means including a generally arcuate ramp associated with said strip preforming and feeding means for accepting individual batches of said dough from said dough divider at a discharge location; transport means including a rotatable wheel associated with said strip preforming and feeding means for transporting said batches from said discharge location to said strip transport and feed means; strip preforming means associated with said transport means for preforming said batches into generally cylindrical strips of dough having a predetermined length and diameter while transporting said batches from said discharge location to said strip transport and feed means, said strip preforming means including said ramp encircling a substantial portion of said wheel and forming a space between the outer periphery of said wheel and the inner peripheral surface of said ramp for receiving said individual batches of dough between the outer periphery of said wheel and the inner peripheral surface of said ramp whereby said batches of dough are preformed into strips of dough when said wheel is rotated; moving sidewalls means encircling at least a portion of said wheel independent of the rotation of said wheel engaging each end of said strips being transported along said wheel for assisting in the transport of said strips therealong and eliminating drag thereon; and

drive means associated with both said moving sidewall means and said wheel for driving both said sidewall means and said wheel in the same direction.

3,897,190

PRESS TOOL FOR PRODUCING MICROCELLULAR SHAPED PIECES OF DIMENSIONAL ACCURACY, PARTICULARLY SHOE SOLES

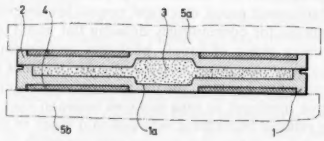
Boris Nisonovich Binzburg; Jury Alexandrovich Smetkin; Vladimir Iosifovich Alexeenko; Vsevolod Andreevich Mikhailov, all of Moscow, U.S.S.R.; Ivan Lorant, Budapest, Hungary; Gyozo Seltenreich, Dunakeszi, Hungary; Jeno Kaszei, Budapest, Hungary; Gyorgy Marton, Budapest, Hungary; Albert Balazsfai, Budapest, Hungary; Jeno Donath, Budapest, Hungary, and Erno Bolcskei, Budapest, Hungary, assignors to Bor-, Mubor- es Cipoipari Kutato Intezet, Budapest, Hungary and Vsesojuzny Nauchno Issledovatelsky Institut Plenochnykh Materialov i Iskusstvennoi Kozhi, Moscow, U.S.S.R.

Division of Ser. No. 96,738, Dec. 10, 1970, abandoned. This application Feb. 13, 1973, Ser. No. 332,089

Claims priority, application Hungary, Dec. 30, 1969, BO 1210

Int. Cl. B29c *3/00*

U.S. Cl. 425—383 **4 Claims**



1. A press mold for vulcanizing plastic materials, comprising a pair of mold parts defining between them a mold cavity, each of said mold parts having channels therethrough for the passage of a heating medium for vulcanizing the plastic material in the mold, each mold part comprising an upper plate and a lower plate, each lower plate having a plurality of said channels therein which open upwardly and are closed by the upper plate.

3,897,191

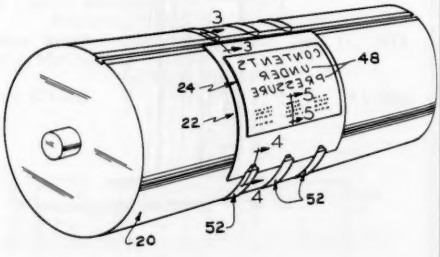
MOUNTING MEMBER FOR PRINTING PLATE AND APPARATUS OF MAKING SAME

Philip G. Saunders, and Neil M. Waterbury, both of Toledo, Ohio, assignors to Container Graphics Corporation, Toledo, Ohio

Division of Ser. No. 345,573, March 28, 1973, abandoned. This application Apr. 19, 1974, Ser. No. 462,225

Int. Cl. B29c *17/02*

U.S. Cl. 425—384 **4 Claims**



1. Apparatus for making a mounting sheet for mounting a printing plate on a printing cylinder, said mounting sheet having a structurally-integral lip, said apparatus comprising means for supporting a heat-softenable plastic sheet of a given size and shape and having at least one straight edge, an entry zone having means for receiving and positioning the edge of the sheet, at least one heating and forming zone having means

for heating the edge of the sheet and for bending the edge upwardly away from the plane of the sheet and rearwardly in a direction substantially parallel to the plane of the sheet to form the structurally-integral lip, and a cooling zone having means for cooling the bent edge of the sheet while maintaining the bent edge in its bent position.

3,897,192

APPARATUS FOR MAKING MONOFILAMENTARY SLIDE-FASTENER MEMBERS

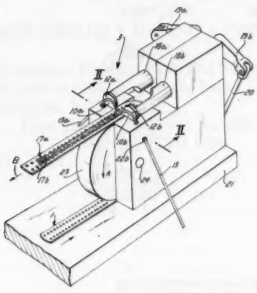
Helmut Heimberger, Locarno, Switzerland, and Karl Griessbaum, Essen, Germany, assignors to Opti-Holding AG, Glarus, Switzerland

Filed June 5, 1974, Ser. No. 476,598

Claims priority, application Germany, June 9, 1973, 2329637

Int. Cl. B29d *5/00*; **B29c** *17/02*

U.S. Cl. 425—391 **6 Claims**



1. An apparatus for making slide-fastener members, comprising:

a frame;

a carrier element mounted on said frame for unidirectional movement, said carrier element being provided with at least one row of lugs rising from a surface thereof, said lugs being spaced apart in the direction of said movement;

feed means on said frame alongside said carrier element for depositing a resinous monofilament on said surface thereof in a succession of narrow loops received between consecutive lugs, said feed means including a guide element with a ridge in a plane perpendicular to said direction of movement and a transport element in closely spaced relationship therewith for clamping said monofilament therebetween, said transport element being provided with a bulge facing said ridge for locally deforming an engaged loop-forming section of said monofilament to provide a coupling head at a free end of each loop; and drive means for reciprocating said transport element along said ridge in timed relationship with the movement of said carrier element for intermittently advancing successive loop-forming sections of said monofilament into the spaces between consecutive lugs.

3,897,193

VAPOR RECOVERY AND DISPOSAL SYSTEM

Abraham Kattan, Houston, and John E. Gwyn, Pasadena, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sept. 27, 1973, Ser. No. 401,514

Int. Cl. F23j *15/00*; **B01d** *47/00*; **B01j** *9/00*

U.S. Cl. 431—5 **2 Claims**

1. A process for recovering and disposing of gasoline vapor from vapor-laded air expelled from a tank while filling it with gasoline, comprising:

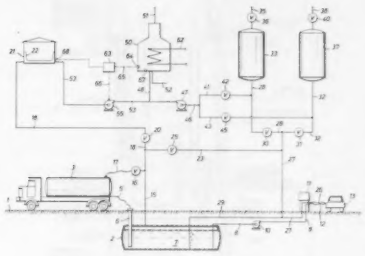
A. collecting said vapors,

B. passing at least some of said vapors through a bed of solid adsorbent capable of selectively adsorbing gasoline from the vapor-laden air,

C. passing air substantially free of gasoline vapors from the other side of said bed of adsorbent to the atmosphere,

D. maintaining a volume of gasoline vapor-rich air,

E. stopping the flow of vapor-laden air through said bed before said adsorbent becomes saturated with gasoline,



F. subsequently backwashing said bed with a backwash gas consisting essentially of air for a period long enough to desorb enough gasoline to regenerate said bed,

G. passing the gasoline-containing backwash air to a furnace wherein the gasoline contained in said backwash air is burned, and,

H. extinguishing the furnace flame when said backwash gas contains insufficient gasoline to support combustion.

3,897,194

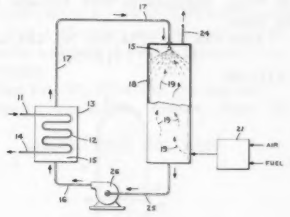
METHOD FOR VAPORIZING A SENSITIVE LIQUID

Peter von Wiesenthal, New York, N.Y., assignor to Heat Research Corporation, New York, N.Y.

Filed Apr. 18, 1974, Ser. No. 462,049

Int. Cl. F23d *11/44*

U.S. Cl. 431—11 **1 Claim**



1. A method of vaporizing liquified natural gas and comprising steps as follows:

passing the liquified natural gas through a heat exchanger in noncontact heat exchange relationship with a liquid heat transfer medium in counterflow heat exchange relationship therewith to vaporize the natural gas thereby cooling the medium,

circulating the cooled medium downwardly through a tower spaced from the heat exchanger so that the cooled medium passes in direct heat exchange relationship with hot combustion gases passing upwardly therethrough,

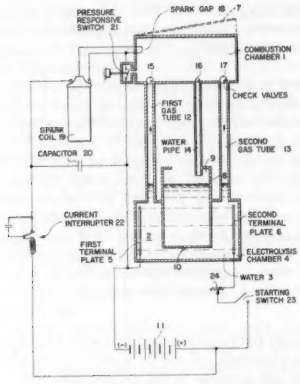
enlarging surface area of the medium in the tower to increase the heat exchange thereto,

burning a fuel in a combustor spaced from the vessel to produce the hot combustion gases.

3,897,195
NOISE MAKING APPARATUS

Raymond C. Finch, Clyde, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 25, 1974, Ser. No. 464,175
Int. Cl.[2] F23H *5/26*
U.S. Cl. 431—19 **4 Claims**



1. Noise making apparatus for protecting crops from wildlife, comprising

a combustion chamber;

gas feeding means for supplying explosive gases to the combustion chamber;

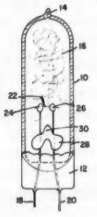
sparking means in the combustion chamber for exploding the gases; and

spark control means for igniting the sparking means when the pressure of gas in the combustion chamber reaches a predetermined level.

3,897,196
PHOTOFLASH LAMP WITH SEALED BEAD

John P. Saunders, Beverly, and Burleigh H. Leach, Hamilton, both of Mass., assignors to GTE Sylvania Incorporated, Ipswich, Mass.

Filed Feb. 21, 1974, Ser. No. 444,343
Int. Cl.[2] F21K *5/02*
U.S. Cl. 431—95 **4 Claims**



1. A photoflash lamp comprising:

an hermetically sealed, light-transmitting envelope;

a quantity of filamentary combustible material located within said envelope;

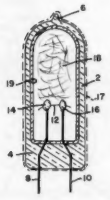
a combustion-supporting gas in said envelope; and

an ignition mount structure disposed in said envelope in operative relationship with respect to said combustible material, said mount structure including a pair of lead-in wires sealed through one end of said envelope, a filament connected across said lead-in wires, and an insulating bead fused about said lead-in wires and located between said filament and the end of said envelope through which said wires are sealed for supporting said wires in a spaced side-by-side relation, the midportion of said insulating bead between said lead-in wires being stretched to protrude toward said filament to provide a raised barrier between locations where the lead-in wires pass through the bead, and a recessed portion immediately below the barrier on the opposite side of the bead, for preventing post-ignition short circuits between said wires.

3,897,197
NEW TRANSPARENT LOW THERMAL CONDUCTIVITY GLASS COMPOSITIONS AND LAMP ENVELOPES MADE THEREFROM

Naila Saba Jirmanus, Somerville, Mass.; Guy E. Rindone, State College, Pa., and Andre C. Bouchard, Peabody, Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed July 10, 1974, Ser. No. 487,076
Int. Cl.[2] F21K *5/02*
U.S. Cl. 431—95 **12 Claims**



1. A photoflash lamp comprising:

an hermetically sealed, light-transmitting envelope;

a quantity of combustible material located in said envelope;

a combustion-supporting gas in said envelope; and

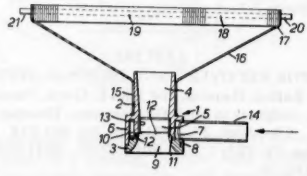
ignition means attached to said envelope and disposed in operative relationship to said combustible material;

said envelope comprising a lead borogermanate glass which is colorless and transparent and which has a thermal conductivity of less than about 19×10^{-4} cal/cm-sec-°C at 100°C, and a composition consisting essentially of the following constituents in about the ranges stated by weight: 20 to 72% GeO_2; 16 to 50% PbO; 10 to 30% B_2O_3; and 0 to 20% additive for modifying one or more of the following properties of said glass: the coefficient of thermal expansion, thermal conductivity and chemical durability.

3,897,198
GASEOUS FUEL BURNERS

Alfred Longworth, Wembley, England, assignor to Radiation Limited, London, England

Filed Apr. 13, 1973, Ser. No. 350,780
Int. Cl. F23d *13/00*
U.S. Cl. 431—160 **9 Claims**



1. A gaseous fuel burner assembly comprising in combination:

a gaseous fuel mixture supply duct,

a gaseous fuel burner having an axis of symmetry, a downstream end in the form of a burner mouth transverse to said axis of symmetry, and an upstream end connected to said gaseous fuel mixture supply duct, and

gaseous fuel diffuser means comprising a body comprising an assembly of spaced, finned pipes extending across the mouth of said burner transversely of said axis of symmetry with the spaces between said fins constituting passageways for uncombusted fuel, said passageways constituting the sole gaseous fuel outlet for said burner, said passageways having inlet ends positioned to receive an uncombusted fuel mixture from said supply duct and outlet ends exposed to the ambient air which constitute substantially the sole flame ports at which combustion takes place, and said pipes constituting coolant passage means in heat exchange relationship with substantially all of said fuel passageways upstream of said flame ports.

3,897,199

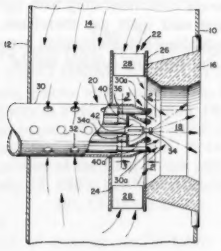
BURNER ASSEMBLY HAVING A TERTIARY AIR NOZZLE

Walter P. Grozegno, Florham Park, and Norman K. Trozzi, W. Caldwell, both of N.J., assignors to Foster Wheeler Corporation, Livingston, N.J.

Filed July 5, 1974, Ser. No. 486,254

Int. Cl.[2] F23M *9/00*

U.S. Cl. 431—184 **9 Claims**



1. A burner assembly for mounting adjacent an opening in the wall of a furnace, comprising a collar having one end portion extending in said wall opening, another end portion located externally of said furnace, and a through opening communicating with the interior of said furnace, a sleeve disposed externally of said furnace and having an end portion cooperating with said other end portion of said collar to define a first annular flow passage communicating with said collar opening, a substantially cup-shaped insert disposed in said sleeve with the base of said insert disposed inwardly from said end portion of said sleeve and having a plurality of openings extending therethrough, the wall of said insert cooperating with said end portion of said sleeve to define a second annular flow passage communicating with said collar opening, at least one burner member disposed in said sleeve and adapted to discharge a stream of fuel into said collar opening, and windbox means surrounding said end portion of said sleeve and communicating with said first flow passage for receiving air and directing same to said first flow passage for passage to said collar opening, said sleeve having a plurality of openings extending therethrough for directing air through said second flow passage and through said openings in said base of said insert, for passage to said collar opening.

3,897,200

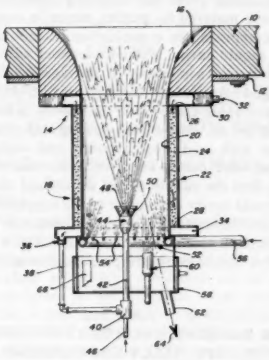
CYCLONIC MULTI-FUEL BURNER

Herman T. Childree, Tyler, Tex., assignor to Howe-Baker Engineers, Inc., Tyler, Tex.

Filed Mar. 4, 1974, Ser. No. 447,613

Int. Cl.[2] F23D *11/44*

U.S. Cl. 431—243 **6 Claims**



1. A burner assembly comprising, in combination, inlet and outlet manifolds, an annular heat exchanger defined by inner and outer walls interposed between and in communication with said manifolds, one wall of said heat exchanger defining a combustor section whereby an atomizing medium flowing through said heat exchanger is heated by transfer of heat from said combustor section through said one wall prior to introduction to an atomizing means, atomizing means for imparting a high velocity tangential vortex to the atomizing medium to react it longitudinally and tangentially on a fuel for aerodynamically mixing the heated atomizing medium intimately with a fuel within said combustor section and to produce molecular shear in the fuel resultant in an atomized fuel having substantially micron size droplets.

3,897,201

PROCESS AND DEVICE FOR PREHEATING MOULDS

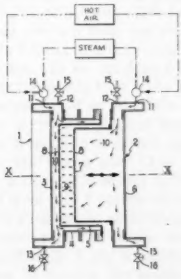
Pierre Belot, Pont-A-Mousson, and Maurice Perrain, Nancy, both of France, assignors to Pont-A-Mousson S.A., Pont-A-Mousson, France

Filed Feb. 27, 1974, Ser. No. 446,432

Claims priority, application France, Mar. 29, 1973, 73.11304

Int. Cl.[2] F27D *7/00, i3/00*

U.S. Cl. 432—4 **4 Claims**



1. In a process for the steam moulding of parts from expanded thermoplastic material in a mould having a mould

cavity defined by walls comprising a wall having a plurality of orifices which put the cavity in communication with a steam chamber to ensure a substantially even distribution of steam in the cavity; the improvement characterized by: preheating the walls of the cavity prior to the supply of steam to said chamber for moulding, by supplying hot air to said chamber which air enters said cavity by way of said orifices.

2. A moulding press for moulding parts from expanded thermoplastic material by putting steam in contact with said material, comprising in combination: a mould having walls defining a mould cavity, a steam chamber adjoining a wall of the mould cavity, a plurality of throughway orifices in said wall arranged substantially throughout said wall for distributing steam from said chamber in said cavity, a source of steam, a source of hot air, inlet means putting said chamber in communication with said steam source and with said hot air source, first valve means combined with said inlet means for permitting first the supply of hot air to said chamber to preheat the mould cavity walls prior to the supply of steam to said chamber and thereafter the supply of steam to said chamber, outlet means for connecting said chamber to a discharge and second valve means controlling said outlet means.

3,897,202

METHOD AND DEVICE FOR HEATING OPEN MELTING BATHS, ESPECIALLY GALVANIZING BATHS, ENAMELING BATHS AND GLASS BATHS

Werner Ackermann, Siegen-Trupbach, and Frohmut Vollhardt, Siegen-Burbach, both of Germany, assignors to SAG Siegener Aktiengesellschaft, Germany

Filed Mar. 26, 1974, Ser. No. 454,823

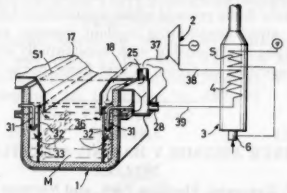
Claims priority, application Germany, Mar. 21, 1974, 2313974

Int. Cl. F27b *14/00*

U.S. Cl. 432—26 **20 Claims**

1. The method of treating an article in a heated liquid bath which comprises immersing said article in said bath in an open immersion area and heating the liquid by circulating an inert gas through a system closed to atmosphere, heating said gas and introducing said gas into said liquid below the surface spaced from said immersion area and collecting said gas passing upwardly through the surface of said liquid to continue circulation without exposure to air.

7. A device for heating open melting baths, especially enameling baths, lead coating baths, metal baths, and glass baths, which includes: container means adapted to receive a melting bath, upright partition means arranged within said container means and at least partially defining gas receiving space means adapted at the upper and lower end portions thereof to communicate with the respective adjacent container space outside said gas receiving means, first conduit means leading into the upper portion of and downwardly in said gas receiving space means for conveying inert gas into said gas receiving space means, collector means arranged above said gas receiving space means for collecting gas ascending in said gas receiving space means, compressor means arranged outside said container means and communicating with said collector means for receiving collected gas therefrom and compressing same, heat exchanger means communicating with said compressor means for receiving said inert gas therefrom, and second conduit means establishing communication between said heat exchanger means and said first conduit means.



3,897,203

CARBAZOLE DYESTUFFS

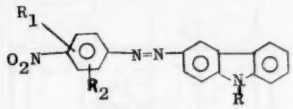
Edgar Earl Renfrew, Lock Haven, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

Continuation-in-part of Ser. No. 230,113, Feb. 28, 1972, abandoned. This application May 25, 1973, Ser. No. 363,843

Int. Cl. D06p *3/00*

U.S. Cl. 8—4 3 Claims

1. A polyester textile material dyed with a compound of the formula



wherein

each of R_1 and R_2 is independently hydrogen halogen, nitro, chloro, bromo, cyano, trifluoromethyl, lower alkoxy, lower alkylsulfonyl, chloro(lower alkyl), carbonamide, lower alkyl carbonamido, di(lower alkyl)carbonamido, sulfamyl, lower alkylsulfamyl, and di-(lower alkyl)sulfamyl;

R is alkyl of 4 to 9 carbon atoms or aralkyl of 7 to 9 carbon atoms, the aryl portion of said aralkyl being a member selected from the group consisting of phenyl, nitrophenyl, chlorophenyl, bromophenyl, cyanophenyl and sulfamylpheny.

3,897,204

METHOD FOR PRINTING TEXTILES USING A PRECOAT CONTAINING β-1,4 GLUCAN

Noriaki Mizuma, Tokyo, and Yuzo Yokota, Oi-Machi, both of Japan, assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 28,144, April 13, 1970, abandoned. This application Feb. 7, 1972, Ser. No. 224,246The portion of the term of this patent subsequent to July 25, 1989, has been disclaimed.

Int. Cl. D06p *1/48*

U.S. Cl. 8—62 3 Claims

1. A method of printing textile fabric which comprises coating said textile fabric with an aqueous dispersion consisting essentially of finely-divided, water-insoluble organic particles at least about 90 percent by weight consisting of β-1,4 glucan and a water-soluble binder, drying said coating, printing a design on said fabric with a colored printing paste, treating the printed textile with the direct application of steam, washing the textile to remove the dried coating and drying the textile.

3,897,205

FIREPROOFING CELLULOSE TEXTILES WITH TETRAKIS (HYDROXYMETHYL) PHOSPHONIUM CHLORIDE AND ANILINE

Arlen W. Frank, Slidell, and George L. Drake, Jr., Metairie, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 6, 1973, Ser. No. 376,971

Int. Cl. D06m *15/54*

U.S. Cl. 8—116 P 1 Claim

1. A process for imparting to a cellulosic textile self-extinguishing character, the process comprising

a. impregnating a cellulosic textile with an aqueous solution containing about 30% of tetrakis(hydroxymethyl)phosphonium chloride,

b. drying the wet impregnated cellulosic textile for about 4 minutes, at about 85°C.,

c. reacting the textile of (b) upon impregnation with an ethanolic solution containing about 60% aniline, and

d. allowing the reaction to come to completion upon air-drying the reimpregnated cellulosic textile.

3,897,206

METHOD OF PREPARING CELLULOSIC TEXTILE MATERIALS HAVING IMPROVED SOIL RELEASE AND STAIN RESISTANCE PROPERTIES

John A. Kearney, Macon, Ga., assignor to The Bibb Company, Macon, Ga.

Filed Dec. 27, 1972, Ser. No. 318,858

Int. Cl. D06m *13/00*

U.S. Cl. 8—120 15 Claims

1. A process for producing cellulosic textile materials having improved soil release and stain resistance properties which comprises impregnating said textile material with a solution of an ethylene-maleic anhydride copolymer or an ethylene-maleic acid copolymer in the presence of an esterification catalyst to cause a reaction between the cellulosic material and the said copolymer; drying the impregnated material at from room temperature to about 300°F., and then curing the impregnated material at a temperature of about 310° to about 410°F.

3,897,207

CARRIER COMPOSITION AND PROCESS FOR DYEING AND PRINTING

Gerhard Weckler, Sulzbach, Taunus, and Rolf Mildenberg, Mulheim (Ruhr) both of Germany, assignors to Cassella Farbwerke Mainkur AG, Germany

Filed July 19, 1973, Ser. No. 380,534

Claims priority, application Germany, July 26, 1972, 2236551

Int. Cl. D06p *5/04*

U.S. Cl. 8—173 8 Claims

1. A carrier composition comprising a mixture of methylnaphthalene and diphenylene oxide in a weight ratio of 1.2:1 to 4:1.

3,897,208

TEXTILE TREATING COMPOSITIONS, PROCESS OF TREATING TEXTILES, AND TEXTILE ARTICLES

Barry M. Shay, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed June 9, 1969, Ser. No. 831,770

Int. Cl. D06m *15/54*, *15/58*

U.S. Cl. 8—187 16 Claims

1. A textile treating composition comprising a durable press agent and an N-methylol or N,N-dimethylol carbamate of an ethylene oxide adduct selected from the group consisting of (1) an ethylene oxide adduct of a fatty acid containing from 12 to 28 carbon atoms, (2) an ethylene oxide adduct of a secondary fatty amine containing from 12 to 28 carbon atoms, (3) an ethylene oxide adduct of an ester of a fatty acid having from 12 to 8 carbon atoms and a polyol having from 2 to 6 hydroxyl groups and from 3 to 6 carbon atoms, and (4) a partial ester of a fatty acid having from 12 to 28 carbon atoms and an oxyethylene adduct of a polyol having from 2 to 6 hydroxyl groups and from 3 to 6 carbon atoms.

13. A process of treating textile material containing cotton which comprises applying to the textile material, a textile treating composition of claim 1 and an acidic curing catalyst and thereafter curing by heating the textile material to an elevated temperature.

15. An article of manufacture which comprises a textile material treated in accordance with the process of claim 13.

3,897,209
CORROSION INHIBITORS FOR METALS IN AQUEOUS SYSTEMS

Arthur Harris, Poynton; John Burrows, Congleton, and Thomas Ivor Jones, Poynton, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 4, 1972, Ser. No. 312,019

Claims priority, application United Kingdom, Dec. 10, 1971, 057413/71

Int. Cl. C02b *5/06;* **C23f** *11/18, 11/12*

U.S. Cl. 21—2.7 R **5 Claims**

1. A process for inhibiting the corrosive attack of an aqueous system on metallic surfaces which comprises adding to the aqueous system from 0.1 to 500 p.p.m. of a composition comprising from 2.5 to 80% by weight of a water soluble zinc compound (calculated as Zn^{++}) and 97.5 to 20% by weight of a hydrolyzed polymaleic ahydride, or of a water soluble salt of such a hydrolyzed polymaleic anhydride, the average molecular weight of the hydrolyzed polymaleic anhydride or the water soluble salt thereof being from 300 to 5000.

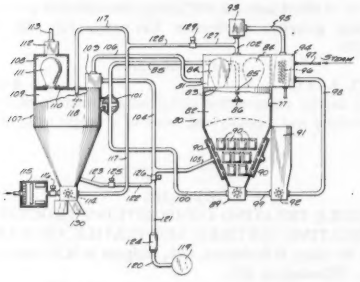
3,897,210
METHOD AND APPARATUS FOR STERILIZING PARTICULATE MATERIAL

Daniel L. Gruber, and Earl D. Pollock, both of Milwaukee, Wis., assignors to Bacfree Industries, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 141,139, May 7, 1971, abandoned. This application Jan. 2, 1973, Ser. No. 320,241

Int. Cl. A61l *1/00;* **A23l** *3/18, 3/34*

U.S. Cl. 21—58 **9 Claims**



1. A method for sterilizing a particulate material comprising the steps of blowing said material via a gas stream into a collector for trapping a substantial portion of the particulate material therein, blowing a sterilizing gas medium through at least a portion of the trapped particulate material to at least partially suspend the particulate material in a fluid state in said sterilizing gas medium and flushing the sterilizing gas medium around the individual particles of said particulate material in the course of blowing said sterilizing gas medium through the suspended particulate material, and pneumatically recirculating sterilizing gas medium from the top of the collector to the bottom of the collector for repeated blowing through the suspended particulate material, plus the step of selectively pneumatically recirculating sterilizing gas medium containing particulate material from the bottom of the collector to the top of the collector for repeated flushing of the particulate material by the sterilizing gas medium and, after said particulate material has been sterilized, discharging the particulate material from the collector.

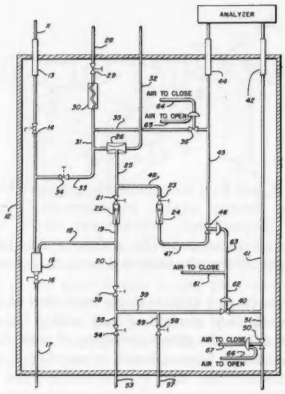
3,897,211
SAMPLE CONDITIONER

Otis E. Ririe, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 6, 1973, Ser. No. 385,883

Int. Cl. G01n *1/22, 31/00*

U.S. Cl. 23—254 R **6 Claims**



1. Apparatus for conditioning a gaseous sample which is to be analyzed, which comprises a heated cabinet, means for introducing a gaseous sample into said cabinet, by-pass means within said cabinet for diverting a portion of said gaseous sample and exhausting it from said cabinet without analysis, sample conveying means within said cabinet for conveying a predetermined portion of said gaseous sample to analyzing means, means for achieving atmospheric equalization of the pressure within said sample conveying means, and means for purging with air said sample introducing means, said by-pass means and said sample conveying means.

3,897,212
TEST FOR SYSTEMIC LUPUS ERYTHEMATOSUS

Shalom A. Leon, Elkins Park; Bernard Shapiro, and George J. Kollmann, both of Narberth, all of Pa., assignors to Albert Einstein Medical Center of Philadelphia, Philadelphia, Pa.

Filed Jan. 30, 1973, Ser. No. 327,913

Int. Cl. G01n *33/16, 31/02*

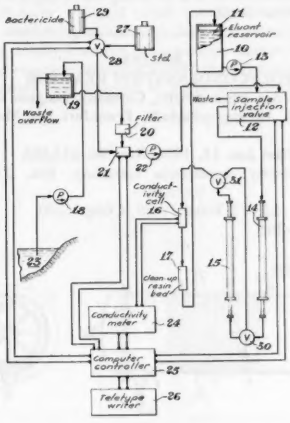
U.S. Cl. 23—230 B **9 Claims**

1. A method for testing patients for systemic lupus erythematosus comprising the steps of taking a sample of serum from a patient to be tested, labeling a sample of native DNA with ^{125}I by introducing ^{125}I-labeled 5-iododeoxyuridine into the DNA molecule, mixing together, in the presence of a buffer, portions of said ^{125}I-labeled DNA and said serum, incubating the resulting mixture to allow complexing of the DNA with any anti-DNA antibodies p.esent in the serum, adding to said mixture a precipitating agent for antibody/DNA complexes which precipitating agent will not precipitate non-complexed DNA, separating the mixture into supernatant and precipitate fractions, and determining the respective radioactivities of the separated fractions, a high degree of radioactivity in the precipitate fraction indicating substantial complexing of DNA with antibodies which represents a positive test for systemic lupus erythematosus.

3,897,213
AUTOMATED QUANTITATIVE ANALYSIS OF IONIC SPECIES

Timothy S. Stevens, Midland, and William H. Parth, Saginaw, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 6, 1973, Ser. No. 386,259
Int. Cl. B01d *15/08;* **G01n** *27/00*
U.S. Cl. 23—253 R **18 Claims**



1. Integrated system utilizing ion exchange resin means in automated analysis of a sample solution containing at least one ionic species to be quantitatively determined, which comprises:

a reservoir for eluant water;

valve means for selecting a predetermined-sized quantity of sample solution;

hydraulic pressure means for delivery of the eluant water to the said valve means;

ion exchange resin bed means receiving eluant water and selected sample solution from the valve means;

a conductivity cell receiving the effluent from the ion exchange resin bed means;

clean up resin bed means receiving the effluent from the conductivity cell;

liquid conduit means connecting in series in a closed loop in the following sequence: the reservoir, the hydraulic pressure means, the valve means, the ion exchange resin bed means, the conductivity cell, and the clean up resin bed means;

readout means associated with the conductivity cell;

means for delivering to the said valve means, at mutually exclusive times, sample solution, and standard solution;

and a computer-controller coordinating the introductions of sample solution and of standard solution with the readout means.

3,897,214
DIAGNOSTIC DEVICE

Hans Lange, Lampertheim; Walter Rittersdorf, and Hans-Georg Rey, both of Mannheim-Waldhof, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

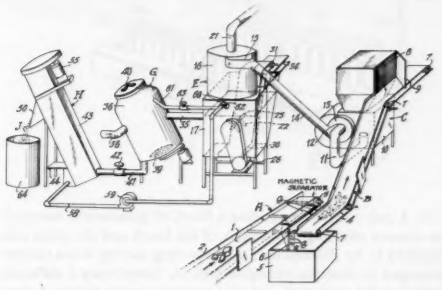
Filed Nov. 13, 1972, Ser. No. 306,127
Claims priority, application Germany, Nov. 24, 1971, 2158124
Int. Cl. G01n *29/02, 31/22, 33/16*
U.S. Cl. 23—253 TP **17 Claims**

1. Diagnostic device for the detection of components contained in liquids, which diagnostic device comprises an absorbent carrier comprising felt or fleece preponderantly consisting of polyamide fibers, wherein said carrier is impregnated with appropriate reagents.

3,897,215
CONVERTING MUNICIPAL REFUSE INTO COMPOST

William Davidson, Jr., Fairfield, and Charles H. Kauffman, Newark, both of N.J., assignors to Charles H. Kauffman, Newark, N.J.

Filed Apr. 27, 1973, Ser. No. 355,059
Int. Cl. C05f *9/02;* **B03b** *7/00;* **B02c** *18/40*
U.S. Cl. 23—259.1 **3 Claims**



1. Apparatus for converting municipal refuse into compost comprising:

a separator means for removing ferrous materials from the refuse,

grinding means for reducing the refuse to finely divided particles,

means for conveying to said grinding means from said separator means the refuse thus freed of ferrous materials,

means for separating glass particles and particles of other non-ferrous materials, said means comprising a tank containing a body of liquid, and cyclonic air separator chamber having a cylindrical wall mounted on said tank above said body of liquid with the lower end of said wall extending downwardly into said body of liquid below the surface thereof so that the surface of the liquid forms the bottom wall of the chamber, said chamber including a top wall having an outlet pipe extending into the chamber, said chamber also having a tangential air inlet above the lower end of said outlet pipe,

means including a power driven centrifugal air pump having its inlet communicating with said grinding means and its outlet connected to said tangential air inlet of said cyclonic air separator chamber for conveying the particles from the grinding means to the cyclonic separator chamber under positive air pressure whereby the particles are aerated and fall by gravity on the surface of the liquid and the heavier particles sink in the body of liquid while the lighter particles are suspended in the liquid in form of a slurry, means for agitating the slurry, means for removing the heavier particles from the slurry at the bottom of said tank,

a wet pulping apparatus,

means for removing the slurry from the tank adjacent the surface of the slurry and conveying said slurry to said wet pulping apparatus in a mixture containing about ninety percent liquid which further finely divides and washes the particles and produces a homogenized wet pulpy mixture devoid of glass particles and other heavier non-ferrous particles,

a drier for dehydrating said pulpy mixture into a dehydrated mass having a moisture content of the order of 50 percent,

and means for conveying said wet pulpy mixture from said wet pulping apparatus to said drier.

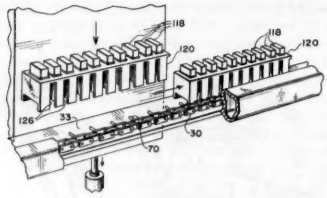
3,897,216
SAMPLE CUP HOLDER

Alan Richardson Jones, Miami, Fla., assignor to Coulter Chemistry, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 195,363, Nov. 3, 1971, Pat. No. 3,791,509, and a continuation-in-part of Ser. No. 391,571, Aug. 27, 1973, abandoned, which is a division of Ser. No. 189,092, Oct. 14, 1971, Pat. No. 3,799,744. This application Oct. 15, 1973, Ser. No. 406,675

Int. Cl. G01n *1/14, 1/18, 21/24*

U.S. Cl. 23—259 **25 Claims**



1. A cup carrier comprising a block of translucent material, an opaque covering on one side of the block and the other side adapted to be illuminated, said covering having holes therein arranged in machine-readable indicia, there being a different indicium for each cup, and said covering being made of magnetizable material whereby said carrier can be easily stored in a magnetic hopper, and said carrier being adapted to be passed between a source of illumination and a photoresponsive device to enable said indicia to be read.

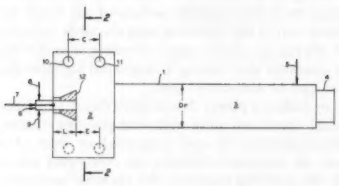
3,897,217
CARBON BLACK PRODUCTION PROCESS AND REACTOR

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 24, 1973, Ser. No. 391,476

Int. Cl. C09c *1/50;* **F23d** *13/40*

U.S. Cl. 23—259.5 **8 Claims**



1. A carbon black reactor comprising
a. a tubular enlarged mixing section;
b. a tubular reaction section in open communication and axial alignment operatively connected with said enlarged mixing section;
c. hydrocarbon feed means connected to said reactor for the axial introduction of hydrocarbon feed into said enlarged mixing section;
d. first conduit means for the introduction of hot combustion gases into said enlarged mixing section;
e. second conduit means for the introduction of hot combustion gases into said enlarged mixing section, the outlet of said second conduit means being located axially downstream of the outlet of said first conduit means;
f. a conical diffuser member positioned in said enlarged mixing section such that the smaller upstream end thereof is proximate to the locus of discharge of said hydrocarbon feed means, said diffuser member further having a tubular passageway longitudinally traversing its length along the reactor axis for passing the hydrocarbon feed through said passageway into said enlarged mixing section, said diffuser member further having a plurality of channels opening through the periphery of the smaller upstream end thereof so as to establish communication between said enlarged mixing section and said passageway and having the larger downstream end thereof terminating axially downstream of the outlet of said first conduit means; and
g. carbon black recovery means connected to the end of said reaction section.

3,897,218
POLYCONDENSATION REACTOR

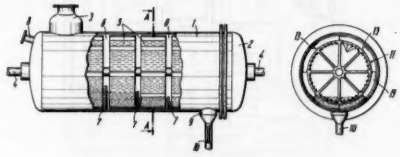
Walter Busweiler, Bischofsheim, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 15, 1974, Ser. No. 433,606

Claims priority, application Germany, Feb. 23, 1973, 2309027

Int. Cl. B01d *19/00;* **C08g** *35/00*

U.S. Cl. 23—285 **6 Claims**



1. Polycondensation reactor comprising shell means adapted to be heated and having at least one inlet and outlet for feed and product, respectively, rotatable inner means which is at least partly immersed into the material being reacted, said inner means including a plurality of successive rotary drum means each having an apertured shell provided with distribution tongues protruding into the drum, and with outwardly extending scoops, said rotary drums being mounted on a common, approximately horizontal shaft so as to leave a gap between adjacent drums, and partition means detachably secured to the bottom of the shell means and extending into the gaps between adjacent drums, said partition means decreasing in height toward said outlet.

3,897,219
APPARATUS FOR THE REMOVAL OF HYDROGEN SULFIDE AND MERCAPTANS FROM LIQUID AND GASEOUS STREAMS

Jacques Pierre Sibeud, Princeton, and Charles David Ruff, Highland Park, both of N.J., assignors to Rhodia, Inc., New York, N.Y.

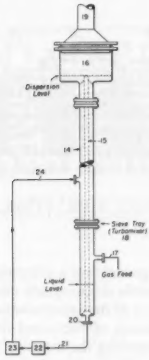
Continuation-in-part of Ser. No. 166,894, July 28, 1971, abandoned. This application Jan. 29, 1973, Ser. No. 327,278

Int. Cl. B01j *9/16*

U.S. Cl. 23—288 A **6 Claims**

1. An apparatus for the capture of hydrogen sulfide and alkyl mercaptans in gaseous streams, and the catalytic conversion thereof to sulfur and dialkyl disulfides, respectively, comprising, in combination, a contactor defining a substantially cylindrical elongated reaction chamber; a gas feed inlet at the bottom of the reaction chamber; a liquid aqueous catalyst solution inlet at the bottom of the reaction chamber; means for forming an intimate unstable dispersion short of foam formation of gaseous oxygen, hydrogen sulfide, and alkyl mercaptans entering via the gas feed inlet in liquid aqueous catalyst solution and for passing the dispersion in turbulent flow cocurrently upwardly through the reaction chamber; and a gas separator for reception of dispersion from the reaction chamber and defining a substantially cylindrical gas separation chamber directly above the reaction chamber, coexten-

sive therewith in a central portion and having a peripheral portion extending circumferentially about and beyond the peripheral portion of the reaction chamber, the gas separation chamber having an overall diameter larger than the diameter of the reaction chamber and exposing a relatively large surface area of dispersion to a gas layer thereabove within the gas separation chamber to facilitate breaking of the dispersion into a lower liquid layer and a separation of gas therefrom, the gas separator having in an upper portion a gas outlet for removal of the gas in the gas layer and, at or below the level of the liquid layer, a liquid outlet for liquid aqueous catalyst solution containing sulfur and dialkyl disulfides; a conduit extending axially from the gas separator chamber through the elongated reaction chamber toward the inlet end of the reaction chamber, and adapted to carry liquid catalyst solution



from the gas separator chamber; and means for maintaining a liquid level within the gas separation chamber and thereby within the reaction chamber by overflow; the ratio of the diameter of the reaction chamber to the diameter of the gas separator chamber being within the range from about 1:1.2 to about 1:20, expressed in metric units, the length of the reaction chamber being within the range from about 2 feet to about 20 feet, and the diameter of the reaction chamber being within the range from about 4 inches to about 40 feet; the ratio of diameter to height of the gas separation chamber being within the range from about 60:1 to about 1:1, the height of the gas separation chamber being within the range from about 2 inches to about 10 feet, and the diameter of the gas separation chamber being within the range from about 5 inches to about 60 feet.

3,897,220

CATALYTIC REACTORS

Leslie Alcock, Bexleyheath, and James Ford, Northfleet, both of England, assignors to The British Petroleum Company, Limited, London, England

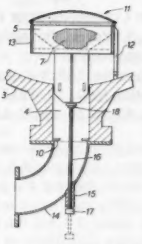
Filed Dec. 27, 1973, Ser. No. 428,753

Claims priority, application United Kingdom, Jan. 23, 1973, 3336/73

Int. Cl. B01j *9/04*

U.S. Cl. 23—288 R **3 Claims**

1. A grid system for a catalytic reactor outlet comprising cylindrical or rectangular shaped grid adapted to seal the outlet to prevent the passage of catalyst and open at at least the end thereof nearest the outlet; a shield located adjacent the grid said shield being adapted and arranged to receive said grid therein and keep the space above and adjacent the grid free of catalyst thereby to allow the grid to be moved easily; said grid having an extension extending into the outlet to position the grid in coaxial alignment with said outlet; and means located in said outlet for moving the grid from the seal



position into the shield to permit the catalyst to be discharged through the outlet.

3,897,221

POROUS METAL STRUCTURE

Ival O. Salyer, Dayton, Ohio, and Robert T. Jefferson, Columbus, Ind., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

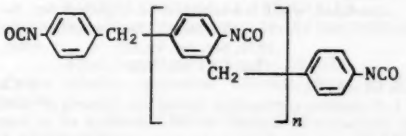
Continuation of Ser. No. 54,298, July 13, 1970, Pat. No. 3,647,721, which is a continuation-in-part of Ser. Nos. 586,923, Oct. 17, 1966, abandoned, and Ser. No. 828,647, May 28, 1969, Pat. No. 3,574,150. This application Sept. 30, 1971, Ser. No. 185,002

Int. Cl. B23p *3/00*

U.S. Cl. 29—191.2 **1 Claim**

1. A porous metal structure made by heating at a sufficient temperature to remove the polyurethane an open-pore polyurethane structure containing powdered metal dispersed in said polyurethane, said structure comprising coherent, roughly spherical polyurethane particles containing said powdered metal, said spherical particles sticking together in an interconnected matrix, and in which the polyurethane is the product of the reaction between

a. a mixture of polyaryl polyalkylene polyisocyanates having the formula



wherein *n* has an average value of 0.5–2.0, containing about 40–50 percent diisocyanate, the balance being tri-, tetra- and pentaisocyanates, having a functionality of about 2.1–3.5, and

b. a polyol obtained by totally oxypropylating an amine selected from the group consisting of amines having the formula $NH_2—R—NH_2$ where R is an alkylene radical containing from 2 to 6 carbon atoms and amines having the formula

$$NH_2-(CH_2)_x-\underset{H}{N}-(CH_2)_x-NH_2$$

where x is an integer of from 2 to 3, and y is an integer of from 1 to 3.

3,897,222

PROTECTIVE COATING FOR FERROUS METALS

Andrew Craig Hood, Wayne, Pa., assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Continuation of Ser. No. 149,360, June 2, 1971, abandoned. This application Sept. 19, 1973, Ser. No. 398,578

Int. Cl. B32b *15/00;* **C23b** *5/04*

U.S. Cl. 29—195 **9 Claims**

1. The method of protecting ferrous metal to inhibit corrosion which comprises coating said ferrous metal with a layer, from about 0.1 mil to about 0.4 mil thick, of a more noble metal, and then coating said more noble metal with a sacrificial layer, at least about 0.3 mil thick, by applying thereto a composition consisting essentially of about 10 to 2000 grams of aluminum powder, having a grain size less than 325 mesh, per liter of an aqueous solution of a combination of phosphoric acid, chromic acid, or molybdic acid, or salts of said acids, and then heat curing said composition at a temperature from 350° to 1000°F. for a time between at least 24 hours at the lowest temperature in the range specified to about 15 minutes at the highest temperature in the range specified, until said composition is water-insoluble.

3,897,223

NB JOINED TO ALUMINA WITH NI-TI EUTECTIC SEAL

David L. Purdy, and John F. Williams, both of Indiana, Pa., assignors to Arco Nuclear Company, Leechburg, Pa.

Division of Ser. No. 374,011, June 27, 1973, which is a division of Ser. No. 127,807, March 4, 1971, abandoned, which is a division of Ser. No. 624,916, March 21, 1967, Pat. No. 3,599,317. This application Oct. 17, 1974, Ser. No. 515,806

Int. Cl.² B32B *15/04*

U.S. Cl. 29—195 **2 Claims**

1. A vacuum-tight assembly consisting essentially of a member of aluminum oxide and a member of niobium, a mass consisting essentially of nickel and titanium in eutectic proportions melting at about 1,125°C. contiguous to and bonded to said members, the aluminum oxide member and niobium member having thermal coefficients of expansion which closely match over a wide range of temperatures, whereby a vacuum-tight assembly is maintained at the high temperature at which generators having a radioactive heat source operate.

3,897,224

GASOLINE CONTAINING ASHLESS DISPERSANT

Roger E. Chandler, Westfield, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 657,532, Aug. 1, 1967, abandoned, which is a continuation-in-part of Ser. No. 337,187, Jan. 13, 1964, abandoned. This application Dec. 17, 1970, Ser. No. 99,321

Int. Cl. C10l *1/22*

U.S. Cl. 44—71 **3 Claims**

1. A gasoline composition having the property of reducing the formation of deposits in the carburetor of an internal combustion engine burning gasoline, which comprises gasoline to which has been added, in the amount of from about 10 to about 50 pounds per thousand barrels of said gasoline, of an amide obtained from 1 mole of an aliphatic polyamine and in the range of from 1 to 5 moles of a high molecular weight monocarboxylic acid, said acid being the product of alkylating acrylic acid with a C_2 to C_5 mono-olefin polymer of from about 600 to about 3,000 molecular weight, said aliphatic polyamine being an alkylene polyamine having the formula: $NH_2(CH_2)_n-[NH(CH_2)_n]_m-NH_2$ wherein n is 2 to 3 and m is a number from 0 to 10.

3,897,225

METHOD AND APPARATUS FOR GENERATING A GAS MIXTURE TO BE FORMED THROUGH CATALYTIC CONVERSION OF FUEL AND A GAS SERVING AS AN OXYGEN CARRIER

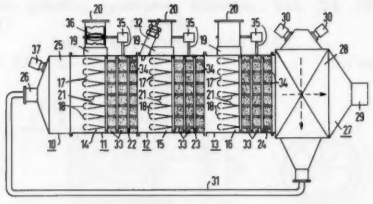
Hans-Joachim Henkel; Eugen Szabo DeBucs, both of Erlangen, and Christian Koch, Nurnbert-Grossgrundlach, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 21, 1973, Ser. No. 372,422

Claims priority, application Germany, July 3, 1972, 2232506

Int. Cl. C01b *2/16*

U.S. Cl. 48—107 **14 Claims**



1. A method for generating a reformed gas mixture which contains as combustible components essentially carbon monoxide, and at least one of the group consisting of hydrogen and methane from a mixture of vaporized liquid fuel and an oxygen carrier gas comprising the steps of:

a. converting the mixture in a first catalytic reaction stage into gas and unconverted fuel;

b. converting further amounts of the unconverted fuel from the output of said first reaction stage in at least one further reaction stage in series with said first stage to obtain reformed gas;

c. mixing an oxygen carrier gas with the output of each reaction stage which is to be converted in a further reaction stage, said mixing being accomplished after the output leave a stage but ahead of its entry into the further reaction stage;

d. controlling the amount of oxygen in the oxygen carrier gas in the mixture provided to each reaction stage as a function of the temperature in that reaction stage such that the amount of oxygen in the gas mixture is increased with decreasing temperature; and

e. wherein the oxygen carrier gas mixed with the vaporized liquid fuel and converted in said first catalyst reaction stage consists of a mixture of the exhaust gas of an internal combustion engine and air with the percentages of air and exhaust gas varying between 0 and 100% and wherein the oxygen carrier gas admixed ahead of each further reaction stage is air.

6. Apparatus for catalytically converting a mixture of a vaporized liquid fuel and an oxygen carrier gas into a reformed gas which contains as combustible components essentially carbon monoxide, and at least one of the group consisting of hydrogen and methane comprising:

a. first means comprising:

1. a first mixing chamber; and

2. a first catalytic reaction chamber coupled thereto and in flow communication therewith;

b. at least one further means comprising:

1. a further mixing chamber; and

2. a further catalytic reaction chamber;

c. the mixing chamber of each further means coupled to the output of the catalytic reaction chamber of a previous means and in flow communication therewith;

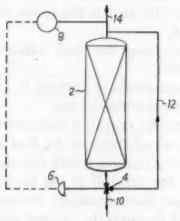
d. means for vaporizing the liquid fuel;
e. means to provide the vaporized fuel to said first mixing chamber;
f. first means for providing a mixture of the exhaust gas of an internal combustion engine and air with the percentages of air and exhaust gas varying between 0 and 100% to said first mixing chamber and second means for providing air to said further mixing chamber;
g. means defining an outlet coupled to the output of the furthest reaction chambers and in flow communication therewith;
h. thermal sensing means installed in each of said reaction chambers; and
i. means responsive to said thermal sensing means to control the supply of the mixture of exhaust gas and air respectively to each of said mixing chambers such that the amount supplied is increased with decreasing temperatures.

3,897,226

CONTROLLING THE CONCENTRATION OF IMPURITIES IN A GAS STREAM

Keith Stanley Doherty, Cheadle, England, assignor to Petrocarbon Developments Limited, Manchester, England

Filed Apr. 19, 1973, Ser. No. 352,748
Claims priority, application United Kingdom, Apr. 19, 1972, 18166/72
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—33 **19 Claims**



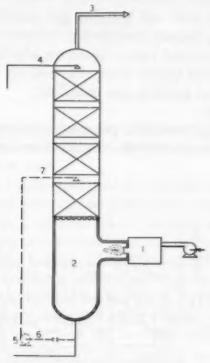
1. A method of upgrading an impurity-containing gas stream in which the concentration of the impurity varies with time, to provide a product stream in which the concentration of impurity substantially does not exceed a predetermined value which is between the maximum and minimum levels of concentration of impurity found in the gas stream said method comprising:
i. sensing the level of concentration of impurity in the gas stream;
ii. when the sensed level of concentration of impurity in the gas stream rises to said predetermined value, withdrawing at least a part of said gas stream, purifying said withdrawn part by passing said part through an adsorption zone containing adsorbent for said impurity whereby to adsorb said impurity from said withdrawn part, and thereafter re-combining the purified part with any remainder of said gas stream to form said product stream;
iii. continuing step (ii) while the concentration of impurity in the gas stream exceeds said predetermined value;
iv. controlling the proportion of gas stream that is withdrawn and purified in accordance with steps (ii) and (iii) so as to maintain the overall concentration of impurity in said product stream substantially at or below said predetermined value;
v. after the concentration of the impurity in said gas stream has returned below said predetermined value, regenerating said adsorbent for subsequent re-use by withdrawing at least a part of said gas stream and passing said part through said adsorption zone whereby to desorb from said adsorbent impurity adsorbed thereby during steps (ii) and (iii);
vi. terminating step (v) after the impurity adsorbed by said adsorbent during steps (ii) and (iii) has been substantially removed; and
vii. repeating steps (ii) through (vi) each time the sensed concentration of impurity in the gas stream rises to said predetermined level.

3,897,227

PROCESS FOR THE REMOVAL OF CARBON DIOXIDE AND/OR HYDROGEN SULPHIDE AND OTHER ACIDIC GASES FROM GAS MIXTURES

Giuseppe Giammarco, and Paolo Giammarco, both of Venice, Italy, assignors to Vetrocoke Cokapuania S.p.A., Venezia Porto Marghera, Italy

Filed Apr. 26, 1973, Ser. No. 354,729
Claims priority, application Italy, Apr. 26, 1972, 68286/72
Int. Cl. B01d *53/14*
U.S. Cl. 55—68 **5 Claims**



1. In a process for removing an acidic gas of the group of carbom dioxide and hydrogen sulphide from a gaseous mixture by absorbing the acidic gas by means of an aqueous absorbing solution in an absorption stage, transferring the fouled solution to a regeneration stage in which the absorbed acidic gas is removed from the solution, and recirculating the regenerated solution to the absorption stage, the improvement comprising regenerating the solution in the regeneration stage by burning a combustible substance in direct contact with the solution or water thereby to obtain a mixture of combustion gases and water vapour, and intimately contacting the latter mixture with the solution to be regenerated thereby to remove therefrom the absorbed acidic gas.

3,897,228

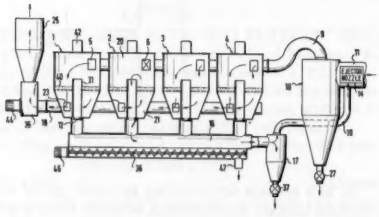
APPARATUS FOR SEPARATING SUSPENDED PARTICLES FROM A CARRIER GAS

Wolfgang Berz, Mauerkircherstrasse 13, 8 Munich 80, Germany

Filed Aug. 28, 1974, Ser. No. 501,184
Claims priority, application Germany, Sept. 7, 1973, 2345344
Int. Cl.[2] B01D *35/12, 50/00*
U.S. Cl. 55—273 **10 Claims**

1. Apparatus for separating suspended solid particles from a carrier gas comprising, in combination:
a. a source of said carrier gas having said particles suspended therein;
b. preliminary separator means for removing a portion of said particles from said gas, said separator means having an intake port communicating with said source and a discharge port;

c. a feed manifold communicating with said discharge port;
d. a plurality of filter chambers;
e. a filter medium separating an upper compartment from a lower compartment in each of said chambers, said medium being permeable to said carrier gas while retaining said particles;
f. a plurality of first valve means interposed between said feed manifold and the upper compartments of said chambers respectively and each operable for connecting the associated upper compartment with said feed manifold;
g. a purging gas manifold communicating with said intake port, a portion of said purging gas manifold being elongated in a direction having a predominantly horizontal component and being located below said upper compartment;
h. an upright pipe associated with each of said chambers, said pipe having respective orifices in the upper compartment of the associated chamber and in said portion of said purging gas manifold;
i. second valve means operable for opening and closing each of said pipes and for thereby connecting the associated chambers with said purging gas manifold;
j. operating means operatively connected to each of said first and second valve means for alternatively connecting each of said upper compartments to said feed manifold and to said purging gas manifold;
k. an outlet;
l. a clean gas manifold permanently connecting the lower compartment of each of said chambers with said outlet;



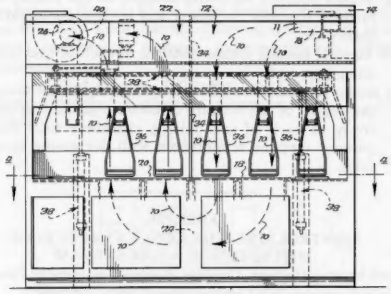
m. first conveying means for conveying said carrier gas from said discharge port sequentially through said feed manifold, through one of said chambers, when the first compartment of said one chamber is connected to said feed manifold by said first valve means, through said clean gas manifold, and through said outlet, whereby particles not removed from said carrier gas by said preliminary separator means are retained from said carrier gas by said filter medium, and the cleaned gas is released from said clean gas manifold through said outlet;
n. second conveying means for conveying said cleaned gas from said clean gas manifold sequentially through another chamber when the first compartment of said other chamber is connected to said purging gas manifold by said second valve means, through the pipe associated with said other chamber, through said purging gas manifold, and to said intake port, whereby particles previously retained on the filter medium in said other chamber are carried by the conveyed gas from said filter medium in said other chamber through said pipe into said purging gas manifold, a part of the carried particles is deposited in said portion of the purging gas manifold adjacent the orifice therein of said pipe due to the change in the direction of flow of the conveyed gas, another part of the carried particles being conveyed with the gas to said intake; and
o. third conveying means for conveying the deposited particles from said portion of the purging gas manifold outward of said purging gas manifold separately from the gas conveyed by said second conveying means.

3,897,229

DUAL ACTION LAMINAR AIR FLOW

George J. Lada, Newport Beach, Calif., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Jan. 25, 1974, Ser. No. 436,577
Int. Cl. B01d *31/00*
U.S. Cl. 55—467 **5 Claims**



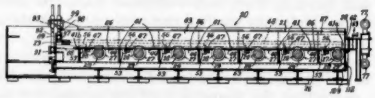
1. A multiple compartment air exhaust system comprising:
first and second separated compartments;
a first air inlet located in the upper portion of the first compartment;
a first exhaust opening located in the lower portion of the first compartment;
a second air inlet located in the lower portion of the second compartment;
a conduit connecting the first exhaust opening and the second air inlet;
a second exhaust opening located in the upper portion of the second compartment; and
means connected to said first compartment for providing a positive flow of air through the first air inlet downwardly through the first compartment into the first exhaust opening, through the conduit to the second air inlet, through the second air inlet upwardly through the second compartment and through the second exhaust opening, each of said compartments being provided with an openable front portion and a working surface in its lower portion, the first exhaust opening and the second air inlet each being a grill located in the working surface along the length of and proximate to the front portion.

3,897,230

COOLING SYSTEM

Harold L. Taylor, Hebron, Ind., and John M. Marshall, South Holland, Ill., assignors to Inland Steel Company, Chicago, Ill.

Filed May 9, 1973, Ser. No. 358,480
Int. Cl. F25d *23/02*
U.S. Cl. 62—266 **14 Claims**



1. An apparatus for cooling work-pieces, comprising:
a tank adapted to contain a cooling liquid bath, said tank having an opening for introducing a work-piece into the tank beneath the bath surface and having means for removing the work-piece from the tank beneath the bath surface;

supporting means comprising a plurality of spaced parallel rollers in said tank for receiving and supporting the work-piece horizontally beneath the bath surface;

combined sealing means and cooling liquid supply means adjacent said opening and adapted to direct upper and lower cooling liquid curtains angularly and inwardly into said tank beneath the bath surface for substantially preventing liquid from flowing out of said opening while permitting the work-piece to be moved horizontally therethrough into said tank with the cooling liquid curtains impinging against the upper and lower surfaces of the work-piece; and

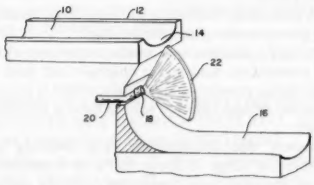
means providing an elongated guide wall between said rollers in spaced relation below the lower surface of the work-piece when the latter is supported on said rollers, thereby defining an elongated restricted cooling channel at the underside of the work-piece, said channel having an inlet end positioned so that the cooling liquid curtain impinging against the lower surface of the work-piece is diverted into said inlet end and flows through said channel at high velocity.

3,897,231

METHOD FOR CONTACTING HOT, VISCOUS, MOLTEN SLAG WITH GASEOUS REACTANTS

Michael J. Massey, Pittsburgh, and Robert W. Dunlap, Ross Township, both of Pa., assignors to Shenango Incorporated; Duquesne Slag Products Co., both of Pittsburgh, Pa. and The Standard Slag Company, Youngstown, Ohio

Filed Feb. 25, 1974, Ser. No. 445,071
Int. Cl. C03b *19/08*
U.S. Cl. 65—19 **6 Claims**



1. A method for intimately contacting hot, viscous, molten slag with a gaseous reactant which comprises:

a. causing the slag to free fall; and

b. applying a controlled amount of gaseous reactant to the slag under force and from beneath the falling slag in the form of a thin wide angle sheet having a plane aligned along the axis of the falling slag to increase the surface to volume ratio of the slag and to create new and additional concave surface area of the slag which surface area is contacted with the reactant.

3,897,232

CONTROLLED FEEDING OF BATCH TO GLASS MAKING PROCESS

Archie L. Groves, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 9, 1974, Ser. No. 432,005
Int. Cl. C03b *3/00*
U.S. Cl. 65—29 **10 Claims**

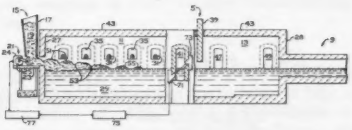
1. In a method of manufacturing glass wherein glass batch materials are periodically fed onto a pool of molten glass contained in a glassmaking furnace, heat is applied to the glass batch materials to form molten glass therefrom by the combustion of fuel in a space within the glassmaking furnace extending above the glass batch materials and the pool of molten glass and molten glass is continuously withdrawn from the glassmaking furnace and cooled and formed into a glass product; the combination of steps of

a. detecting the depth of the pool of molten glass and generating a signal representative of the detected depth of molten glass;

b. maintaining a signal representative of the currently existing time between successive steps of periodically feeding glass batch materials onto the pool of molten glass;

c. generating a signal representative of a time between successive steps of periodically feeding glass batch materials onto the pool of molten glass responsive to the signal representative of the detected depth of molten glass, such generated signal representing a time sufficient to maintain the depth of the pool of molten glass substantially invariant;

d. generating a control signal responsive to both the maintained signal representative of the existing time between successive steps of periodically feeding glass batch materials onto the pool of molten glass and the generated



signal representative of a time between successive steps of periodically feeding glass batch materials onto the pool of molten glass; and

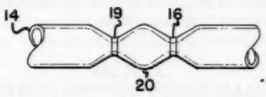
e. feeding glass batch materials by pushing successive substantially equal amounts of glass batch material onto the pool of molten glass wherein the feeding is periodic with intermittent periods without feeding between pushes the periodic feeding having a frequency and the frequency of the periodic feeding is controlled responsive to the control signal to maintain the depth of the pool of molten glass substantially invariant while causing the glass batch materials that have been fed to form a blanket of batch material on the surface of the pool of molten glass, the blanket having substantially uniformly spaced peaks and depressions by maintaining the period between pushes within one percent of the previous period between pushes.

3,897,233

ARC TUBE FORMING PROCESS

Imre Szilagyi, Cleveland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 14, 1974, Ser. No. 433,044
Int. Cl. C03b *23/00*, *23/08*
U.S. Cl. 65—109 **6 Claims**



1. A process for forming small neck envelopes from vitreous tubing comprising the steps of:

heat-softening and necking down the vitreous tubing at two places to provide twin small necks which are short relative to their shoulders with an upstanding portion of vitreous tubing between them;

allowing the quartz to cool sufficiently to be rigid at least in the shoulders remote from said upstanding portion;

then heat-softening and stretching the upstanding portion while shrinking it down to approximately the same diameter as the twin necks in order to provide a long neck without excessive wall thickness, said stretching resulting

from mechanical application of tension to the tubing and said shrinking resulting from application of heat without use of a die;

repeating the foregoing steps to form in a similar way another long neck portion without excessive wall thickness at another place in the tubing;

and then severing the tubing at the two long neck portions in order to release a formed unit having narrow necks at both ends.

3,897,234

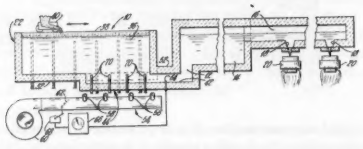
METHOD AND APPARATUS FOR COOLING ELECTRICALLY-HEATED MELTING FURNACE

Magnus L. Froberg, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 22, 1974, Ser. No. 445,037

Int. Cl. C03b *5/02*

U.S. Cl. 65—135 **8 Claims**



1. A furnace for melting a heat-softenable material, said furnace comprising a tank for holding molten material formed by a bottom, side walls, and end walls, means for supplying batch material over molten material in the tank, means extending into the molten material below the batch material for supplying heat to the molten material, wall means forming a cooling trough centrally located in the bottom of the tank, extending below the bottom of the tank, and extending beyond an end wall thereof to discharge molten material from the tank, said wall means being exposed at the sides as well as at the bottom of the trough to ambient conditions below the bottom of said tank to dissipate heat from molten material in said trough, and cooling means extending along said trough and effective to supply a cooling medium in heat exchange relationship with an external surface of said wall means.

6. A method of operating an electrically heated, melting furnace comprising establishing a pool of molten material, supplying batch material onto the surface of the pool to establish a layer of batch over the entire surface, heating the molten material below the batch layer, collecting molten material in a trough below the pool and extending not more than about one-half the length of the pool, directing the molten material in the trough toward a location beyond the pool, and cooling the molten material in the trough, by forcibly directing a cooling medium in heat-exchange relationship with the trough from a location outside the trough.

3,897,235

GLASS BATCH WETTING SYSTEM

Bob G. Wilson, Saugus, Calif., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed May 2, 1974, Ser. No. 466,334

Int. Cl.[2] **C03B** *3/00*

U.S. Cl. 65—335 **7 Claims**

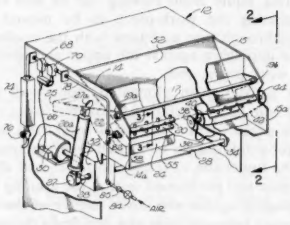
1. In a system for wetting particulate materials being charged to a glass melting furnace comprising:

a housing frame;

guide means within said housing frame for directing particulate materials to an opening in said glass furnace, said guide means including a chute having an outlet opening;

transport means for moving said particulate materials along at least a portion of said guide means from said chute outlet opening into the furnace opening;

fluid emitter means comprising a rotatable hollow shaft located within said guide means proximate said chute outlet opening to directly contact said particulate materials, said shaft including a multiplicity of fluid outlet orifices located along the length thereof;



drive means to power said transport means and cause the rotation of said hollow shaft; and,

fluid conductor means in communication with a fluid source and said fluid outlet orifices.

3,897,236

PROCESS FOR FORMING FERROUS IRON-CONTAINING PHOSPHORUS GLASSES

Gordon J. Roberts, Shaker Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Feb. 15, 1973, Ser. No. 332,631

Int. Cl. C05d *9/02*

U.S. Cl. 71—1 **16 Claims**

12. A process for forming a soil nutritious, ferrous iron-containing phosphorous glass comprising:

a. reacting a reactive iron oxide compound with a mixture of phosphoric acid and a chloride salt, said phosphoric acid being present in an amount which is greater than the amount of said chloride salt, to form a solidified intermediate,

b. heating said intermediate at a smelting temperature within the range of about 900°C to about 1500°C in the presence of an iron-containing reducing agent for a time to produce a ferrous iron-containing glass melt, and

c. cooling said melt to produce a ferrous iron-containing glass, said iron oxide compound, phosphoric acid, chloride salt, and iron-containing reducing agent being used in amounts to provide in said glass a composition consisting essentially in weight percent of about:

	Percent
P_2O_5	50 to 75
FeO	20 to 45
R_2O	0 to 10

in which R is K or Na, and R_2O contains no more than about 50 percent by weight of Na_2O.

3,897,237

PROCESS FOR DISPOSING OF PYROTECHNIC FLARES

Kenneth A. Musselman, Loogootee, and James E. Short, Jr., Switz City, both of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1974, Ser. No. 494,131

Int. Cl.[2] **C05C** *5/02*

U.S. Cl. 71—1 **5 Claims**

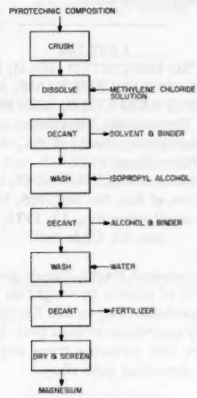
1. A process for isolating and disposing of the chemical ingredients in illuminating flares comprised of magnesium, sodium nitrate, and a binder, said process comprising,

first crushing said chemical ingredients,

then dissolving said binder in a solvent,

then decanting to remove said solvent and the dissolved binder,

then washing the remaining chemical ingredients in water to dissolve sodium nitrate,



then decanting the aqueous solution of sodium nitrate for use as a fertilizer, and

then drying and screening the remaining ingredients for use as a fuel in pyrotechnic devices.

3,897,238

METHOD OF UNIFORMLY DISTRIBUTING SUBSTANCES IN A CARRIER MATERIAL AND PULVEROUS CARRIER MATERIAL

Friedrich Bolsing, Bahnhofstr. 3, 4965 Lindhorst, and Heinrich Mencke, Diepensiepen 47, 5601 Gruiten, both of Germany

Filed Oct. 26, 1971, Ser. No. 192,333

Claims priority, application Germany, Oct. 31, 1970, 2053627

Int. Cl. A01n

U.S. Cl. 71—3 **2 Claims**

1. A method of forming a pulverulent mixture of an oily or bituminous material and the hydroxide of calcium, magnesium or aluminum, which comprises mixing said oily or bituminous material with the oxide, carbide or nitride of calcium, magnesium or aluminum, and contacting said mixture with approximately the stoichiometric amount of water required to form calcium, magnesium or aluminum hydroxide thereby to form said hydroxide, the resulting hydroxide being characterized by a large surface area and being substantially homogeneously mixed with said oily or bituminous material.

3,897,239

USE OF PENICILLIN AS RIPENER FOR SUGARCANE

Louis G. Nickell, Honolulu, Hawaii, assignor to Hawaiian Sugar Planters' Association, Honolulu, Hawaii

Filed Mar. 28, 1974, Ser. No. 455,955

Int. Cl. A01n *9/12*

U.S. Cl. 71—90 **9 Claims**

1. A process for modifying the ripening of field grown sugarcane plants so as to increase its yield of sucrose which comprises applying penicillin in a sucrose increasing amount directly to the cane plants at a time from 2 to 10 weeks prior to harvest.

3,897,240

USE OF BACITRACIN AS RIPENER FOR SUGARCANE

Louis G. Nickell, Honolulu, Hawaii, assignor to Hawaiian Sugar Planters' Association, Honolulu, Hawaii

Filed Mar. 28, 1974, Ser. No. 455,954

Int. Cl. A01n *9/12*

U.S. Cl. 71—90 **6 Claims**

1. A process for modifying the ripening of field grown sugarcane plants so as to increase its yield of sucrose which comprises applying bacitracin in a sucrose increasing amount directly to the cane plants at a time from 2 to 10 weeks prior to harvest.

3,897,241

ETHANOLAMINE/ORGANIC CARBOXYLIC ACID COMPOSITION FOR ACCELERATING FRUIT RIPENING

Shigeaki Washio, Kobe, and Yukiaki Kiguchi, Funabashi, both of Japan, assignors to Taki Fertilizer Manufacturing Co., Ltd., Japan

Filed Aug. 9, 1973, Ser. No. 387,196

Int. Cl.[2] A01N *9/24*

U.S. Cl. 71—113 **3 Claims**

1. A method for accelerating the ripening of fruit which comprises applying to a fruit-bearing plant from 10 to 150 days prior to the expected ripening time an effective amount of a fruit ripening accelerating agent comprising an ethanolamine selected from the group consisting of monoethanolamine, diethanolamine and triethanolamine and an organic carboxylic acid selected from the group consisting of formic acid, acetic acid, oxalic acid, succinic acid, adipic acid, butyric acid, phthalic acid, maleic acid, citric acid, fumaric acid, malic acid, tartaric acid, glutaric acid, pimelic acid, malonic acid, propionic acid and valeric acid, the concentration of said ethanolamine being 10 to 1,000 p.p.m., calculated as CH_2CH_2, the mol ratio of the ethanolamine/organic carboxylic acid being 0.1 to 20, with an inert carrier for said agent.

3,897,242

USE OF 1-(3-CHLORO-4-METHYLPHENYL)-3,3-DIMETHYLUREA IN WHEAT AND BARLEY CROPS

Henry Martin Basel, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 196,790, Nov. 11, 1971, abandoned, which is a continuation-in-part of Ser. No. 797,251, Feb. 6, 1969, abandoned. This application Jan. 17, 1974, Ser. No. 434,146

Int. Cl.[2] A01N *9/20*

U.S. Cl. 71—120 **2 Claims**

1. A method for controlling weeds in wheat and barley cultures which comprises applying to said cultures a herbicidally effective amount of 1-(3-chloro-4-methylphenyl)-3,3-dimethylurea.

3,897,243

SMELTING PROCESS AND FURNACE

Hans-Jüergen Langhammer, Bremen, Germany, assignor to Klockner-Werke AG, Duisburg, Germany

Filed Mar. 2, 1973, Ser. No. 337,736

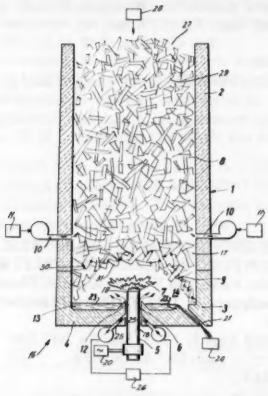
Claims priority, application Germany, Mar. 4, 1972, 2210467

Int. Cl. C22d *7/00*; **C21c** *7/00*

U.S. Cl. 75—10 V **18 Claims**

1. A process for the production of steel from scrap, comprising the steps of admitting a charge into a substantially vertically arranged zone so as to form in said zone a column of said charge which descends by gravity from an upper portion to a lower portion of said zone; melting said charge in the

region of said lower portion of said zone with an electric arc directed at the lower portion of said column; superheating the



resulting molten material with said arc; and evacuating the superheated molten material from said zone substantially continuously during the melting step.

3,897,244

METHOD FOR REFINING IRON-BASE METAL

Crawford B. Murton, 1906 Brushcliff Rd., Pittsburgh, Pa. 15221

Filed June 8, 1973, Ser. No. 368,118
Int. Cl.[2] C21C 7/00; C22B 9/10
U.S. Cl. 75—53 14 Claims

1. A steel refining process for facilitating the solution of solid lime by inhibiting the formation of dicalcium silicate, comprising the steps of

a. adding to a molten body of iron-base metal a quantity of solid burnt lime and a material having high basicity and not including fluorspar and having a melting point lower than that of the solid burnt lime to provide a slag devoid of encapsulated solid bodies of burnt lime,

b. maintaining the metal molten during a first stage refining period and sustaining a slag lime-silica ratio of at least 1:1 while oxidizing a substantial amount of silicon as well as some of the carbon, and

c. maintaining the metal molten after most of the silicon has been oxidized and during a second-stage refining period and increasing the lime-silica ratio to at least 2.5:1 while reducing substantially the amount of carbon and increasing the amount of iron oxide formed.

3,897,245

LOW CARBON STEELS HAVING COLD WORKABILITY

John Savas, Brecksville, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Continuation of Ser. No. 29,183, April 16, 1970, abandoned. This application Nov. 24, 1972, Ser. No. 308,930
Int. Cl. C22c 37/10
U.S. Cl. 75—124 12 Claims

1. A non-aluminum killed, low carbon, non-alloy steel having cold workability, consisting essentially of up to 0.5% carbon 0.05 to 0.4% manganese and 0.05 to 0.25% aluminum, phosphorus and sulfur each not over 0.030%, silicon not over 0.30%, 0 to 0.01% boron, 0 to 0.1% each of one or more elements selected from the group consisting of zirconium, molybdenum and vanadium, balance iron except for incidental impurities, not more than 25 ppm of nitrogen and 35 ppm of oxygen, substantial freedom from hard oxide inclusions, and the presence of the aforesaid aluminum substantially all in metallic state rather than appreciably in combined state that occurs after use of aluminum for killing, so that said composition and characteristics provide improved cold workability of the steel in at least one of the respects of reduced cold work hardening and of avoidance of cracking on compressive cold deformation, in comparison with low carbon, non-alloy, aluminum-killed steels.

3,897,246

NOVEL ELECTRO DEPOSITED GOLD; ELECTROLYTE SOLUTION TO OBTAIN THE SAME; METHOD FOR PRODUCING SAID GOLD; AND PRODUCTS

Richard Henry Zimmerman, Hershey, and Richard Lee Brenneman, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 208,394, Dec. 15, 1971, abandoned, which is a division of Ser. No. 807,105, March 13, 1969, abandoned. This application Aug. 13, 1973, Ser. No. 387,870
Int. Cl. C22c 5/00
U.S. Cl. 75—165 4 Claims

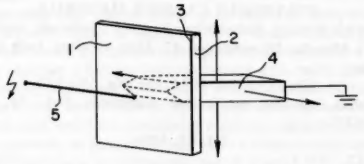
1. An electro deposited bright, ductile gold alloy of arsenic having 0.1 to 0.9% of arsenic by weight on basis of the alloy, having a Knoop hardness of up to 260 Knoop units and a Tafel slope substantially equivalent to pure gold, the amount of gold being the balance and including trace impurities associated with said electro deposited gold alloy.

3,897,247

PROCESS FOR SELECTIVELY DEFORMING A THERMOPLASTIC LAYER

Günther Schädlich, Wiesbaden, and Roland Moraw, Naurod ub. Wiesbaden, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 206,604, Dec. 10, 1971, abandoned. This application Sept. 5, 1973, Ser. No. 394,414
Claims priority, application Germany, Dec. 14, 1970, 2061417
Int. Cl. G03g 13/00
U.S. Cl. 96—1.1 8 Claims



1. In the process for deforming only a selected area of an image on a thermoplastic layer applied to a supporting film by heating said thermoplastic,

the improvement which comprises non-selectively heating the thermoplastic layer from the front by dry thermal treatment and simultaneously contacting the supporting film in the back of the non-selected area with a material having an even surface and good heat conductivity.

3,897,248

PRODUCTION OF PHOTOCONDUCTIVE ZINC OXIDE

Kaizer Esufali Jabalpurwala, St. Lambert, and Henryk Malinowski, LaSalle, both of Canada, assignors to Zochem Limited

Filed May 2, 1973, Ser. No. 356,484
Claims priority, application United Kingdom, May 5, 1972, 21049/72
Int. Cl.[2] G03G 5/08
U.S. Cl. 96—1.8 11 Claims

1. A process for improving the electrophotographic properties of photoconductive zinc oxide powder, comprising the steps of thoroughly blending the zinc oxide powder with a

sulphurizing agent in powder, liquid or gaseous form, the sulphurizing agent being incorporated in a concentration, measured in terms of sulphur content, in the approximate range 0.005% to 0.5% by weight of zinc oxide, tempering the blend in an oxidizing atmosphere at a temperature in the approximate range 500° to 950°C. at which oxidation of the sulphurizing agent will take place, and for a period within the range 10 seconds to 3 hours, and rapidly cooling to room temperature (20°C.).

3,897,249

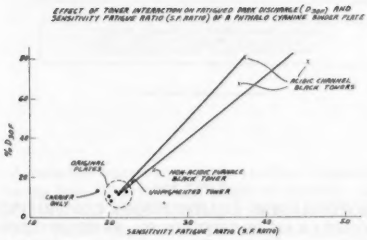
TONERS FOR PHTHALOCYANINE PHOTORECEPTORS

Joseph Mammino, and Gary L. Whittaker, both of Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 9, 1973, Ser. No. 349,491

Int. Cl. G03g *13/08*

U.S. Cl. 96—15 SD **11 Claims**


EFFECT OF TONER INTERACTION ON FATIGUED DARK DISCHARGE (D900) AND SENSITIVITY FATIGUE RATIO (S.F. RATIO) OF A PHTHALO CYANINE BINDER PLATE
% D900
ACIDIC CHANNEL BLACK TONERS
ORIGINAL PLATE
NON-ACIDIC FURNACE BLACK TONER
CARRIER ONLY
UNFATIGUED TONER
SENSITIVITY FATIGUE RATIO (S.F. RATIO)

1. In an electrostatographic reproducing system employing a phthalocyanine photoreceptor and a dry developer comprising a carbon black toner, including the steps of charging said photoconductor, selectively exposing said photoconductor so as to form a latent electrostatic image and developing said photoconductor with said dry developer, the improvement which comprises using a carbon black toner having a pH of at least 7.0 and a carrier in said developing step.

3,897,250

METHOD AND APPARATUS FOR EXPOSING A LIGHT-SENSITIVE LAYER

Paul Weishaupt, Oberburg, Switzerland, assignor to Wagner & Cie AG, Burgdorf/ BE, Switzerland

Filed Apr. 30, 1973, Ser. No. 355,919

Claims priority, application Switzerland, May 15, 1972, 7183/72

Int. Cl. G03c *5/04*

U.S. Cl. 96—27 E **7 Claims**

1. A method of exposing a light-sensitive layer employed for the manufacture of reproductions of black-and-white or color patterns comprising the steps of:

projecting the image of a pattern onto a white or reflective support support;

viewing the projected pattern image on the support with an electronic camera having a video output signal;

storing the video output signal on a recording carrier;

optically exposing all points of a light-sensitive layer with the pattern image using broad-surface illumination which provides a major portion of the total exposure;

additionally exposing the light-sensitive layer with a projected image derived from the video output signal stored on the recording carrier which provides a small portion of the total exposure for correcting contrast or color shades or both of the pattern reproduced on the light-sensitive layer.

3,897,251

PROCESS FOR UTILIZING A PHOTOPRINTING ARTICLE AND METHOD FOR MAKING SAID ARTICLE

Harry Rodney Detrick, Laceyville, and Roland N. Harshbarger, Ulster, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 223,321, Feb. 3, 1972, Pat. No. 3,801,410. This application Sept. 13, 1973, Ser. No. 396,886

Int. Cl. G03c *5/00*

U.S. Cl. 96—38.3 **5 Claims**

1. In a process wherein a relatively thin flat metallic sheet is coated with a light sensitive material, a design is photoprinted on said light sensitive material by use of a master in contact with said coated metallic sheet and contact is established by use of vacuum printing frames and portions of said coating are rendered selectively removable by said photoprinting step and a design is thereafter etched in said sheet, and wherein a master is brought into contact with said sheet wherein said master consists essentially of:

a base of a transparent sheet having at least one essentially planar surface that describes a first plane;

a plurality of upstanding configurations of exposed photographic emulsion material, said configurations spaced in a predetermined pattern to thereby occupy designated portions of said planar surface of said base; and

a solid protective coating formed over said plurality of upstanding configurations and portions of said planar surface of said base unoccupied by said upstanding configurations of said emulsion material, said configurations and said coating thereby providing a gas escapement means when said photographic master and said flat metallic sheet are in contact.

3,897,252

PHOTOCHROMIC IMAGING UTILIZING TETRAZOLIUM COMPOUNDS

Steven Levinos, Summit, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Dec. 3, 1973, Ser. No. 421,180

Int. Cl.² G03C *5/24*

U.S. Cl. 96—48 R **6 Claims**

1. The method of forming a permanent image which comprises:

a. providing light-sensitive imaging material comprising a support and a coating thereon of a composition comprising a light-sensitive component consisting essentially of a water-soluble tetrazolium compound;

b. imagewise exposing said material to actinic light rich in ultraviolet radiation for a time sufficient to convert said tetrazolium compound in the light-exposed areas of said composition to a colored, water-insoluble formazan compound;

c. rinsing said material to remove water-soluble components from said composition; and

d. contacting at least the light-exposed areas of said material with a fixing agent comprising an oxidizer capable of yielding distinctly colored water-insoluble reduction products, thereby at least partially oxidizing said formazan compound and reducing said oxidizer to form said colored reduction products in said light-exposed areas.

3,897,253

PHOTOGRAPHIC ELEMENTS CONTAINING HIGH TEMPERATURE-RESISTANT POLYAMIDES

John Charles Wilson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

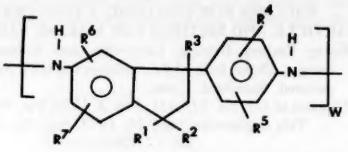
Filed Feb. 21, 1974, Ser. No. 444,611

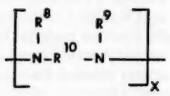
Int. Cl. G03c *1/78*

U.S. Cl. 96—87 R **25 Claims**

1. A silver halide containing photographic element comprising at least one layer containing a film-forming polyamide comprising repeating units having the formulas commprising:

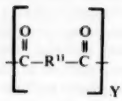
Unit (A)

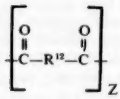




and

Unit (B)





wherein

R^1 and R^3 are independently selected from the group consisting of hydrogen and alkyl of from 1 to 6 carbon atoms; R^2 is alkyl of from 1 to 6 carbon atoms;

R^4, R^5, R^6 and R^7 are independently selected from the group consisting of hydrogen, aryl, halogen, nitro, cyano, tertiary amino or alkoxy; R^8 and R^9 are independently selected from the group consisting of hydrogen, alkyl and aryl;

R^{10}, R^{11} and R^{12} are independently selected from the group consisting of aromatic, cycloaliphatic and aliphatic groups and W is from 1 to 100 mole percent of unit (A) and X is 100−W mole percent of unit (A) and Y is from 1 to 100 mole percent of unit (B) and Z is 100−Y mole percent of unit (B).

3,897,254

SILVER HALIDE CONTAINING PYRAZOLONE MAGENTA COUPLER

Shoji Yamada; Shoichi Horii; Kiyoshi Yamashita; Kiyoshi Futaki, and Mamoru Sekido, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

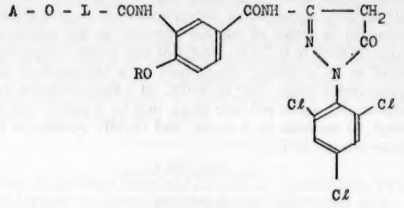
Filed May 10, 1974, Ser. No. 468,995

Claims priority, application Japan, May 11, 1973, 48-52395

Int. Cl.[2] G03C *1/40*

U.S. Cl. 96—100 **3 Claims**

1. A silver halide photographic emulsion comprising a silver halide and a magenta coupler having the following general formula:



wherein R is an alkyl group having 4-8 carbon atoms, A is phenyl group having at least one alkyl substituent, the total number of carbon atoms in said substituents being at least 10 and L is an alkylene or alkyl substituted alkylene.

3,897,255

PHOTOIMAGING COMPOSITIONS COMPRISING COMPLEX OF PROPHYRIN-SO_2 AS SENSITIZER

Floyd B. Erickson, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 190,337, Oct. 18, 1971, Pat. No. 3,801,320. This application Oct. 10, 1973, Ser. No. 405,215

Int. Cl. G03c *1/68*

U.S. Cl. 96—115 R **7 Claims**

1. A composition comprising a photochemically oxidizable polymer containing aliphatic carbon-carbon unsaturation and an adduct or complex of a porphyrin photosensitizer and sulfur dioxide.

3,897,256

REFRACTORY LINING MIXTURE FOR HOT METALLURGICAL VESSELS

Crawford B. Murton, 1906 Brushcliff Rd., Pittsburgh, Pa. 15221

Continuation-in-part of Ser. No. 320,893, Jan. 4, 1973, which is a division of Ser. No. 77,059, Oct. 1, 1970, Pat. No. 3,737,489. This application Jan. 4, 1973, Ser. No. 320,894

Int. Cl. C04b *35/14*

U.S. Cl. 106—68 **8 Claims**

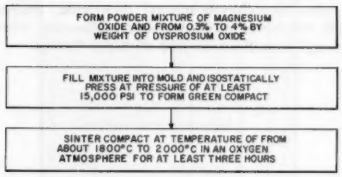
1. A refractory composition suitable for application at temperatures of at least 250°F and being capable of being applied to hot vessels by projection consisting essentially of, by weight, from about ½% to about 4% of at least one of an alkali silicate selected from the group consisting of potassium silicate and sodium silicate, from about ½% to about 4% of organic material, selected from the group consisting of pitch, tar, rosin, polyvinylchloride, polyethyltetrachloride, and mixtures thereof, the organic material having melting points of from about 250° to 400°F, from about 12% to about 72% of quartzite, and from about 20% to about 80% of bonding clay.

3,897,257

LIGHT TRANSMITTING POLYCRYSTALLINE MAGNESIA MEMBER AND METHOD OF MAKING

Tapan K. Gupta, Wilkinsburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 19, 1973, Ser. No. 398,899
Int. Cl. C03c 3/26
U.S. Cl. 106—73.2 5 Claims


FORM POWDER MIXTURE OF MAGNESIUM OXIDE AND FROM 0.3% TO 4% BY WEIGHT OF DYSPROSIUM OXIDE
FILL MIXTURE INTO MOLD AND ISOSTATICALLY PRESS AT PRESSURE OF AT LEAST 15,000 PSI TO FORM GREEN COMPACT
SINTER COMPACT AT TEMPERATURE OF FROM ABOUT 1800°C TO 2000°C IN AN OXYGEN ATMOSPHERE FOR AT LEAST THREE HOURS

1. A radiation-transmitting polycrystalline magnesia member having from 0.3% to 4% by weight of dysprosia dispersed therein, and said member having a density which approximates the theoretical density of said magnesia plus dysprosia.

3,897,258

REFRACTORY SILICEOUS CEMENTS AND THEIR METHOD OF PRODUCTION

Liviu Walter, 11 Impasse Houssay, 92 Neuilly-sur-Seine, France

Continuation of Ser. No. 165,404, July 22, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,574
Claims priority, application France, Aug. 4, 1970, 70.28783
Int. Cl. C04b 1/00
U.S. Cl. 106—85 5 Claims

1. A refractory siliceous barium cement containing as the major constituent dibarium silicate and comprising as minor constituents monobarium silicate, monobarium aluminate, tetrabarium aluminate ferrite, calcium-barium orthosilicate and magnesium-barium orthosilicate, said constituents being present in such proportions that the cement in its clinker stage contains by weight from 75 to 82% BaO, from 14 to 17% SiO_2, less than 3.5% Al_2O_3, less than 1.5% Fe_2O_3, less than 2% CaO, less than 1% MgO and less than 1% alkalis.

3,897,259

PROCESS FOR MANUFACTURING INCOMBUSTIBLES

Shiro Nakajima, Aza-Rokutanda, Aichi-Ken, Japan

Filed Oct. 24, 1973, Ser. No. 409,299
Int. Cl.² C04B 11/00
U.S. Cl. 106—85 3 Claims

1. A process for manufacturing incombustibles, comprising the steps of mixing 55–25 weight % of calcium sulfite hydrate in the form of the aqueous suspension by-product from a smoke-discharging type desulfurizer using lime, with 30–55 weight % of neutral magnesium carbonate and 15–20 weight % of fibrous material, partially dehydrating the suspension by forming a wet mat of the suspension in order to make a formed sheet-like member, heating the formed member at a temperature of 85–95°C. to harden it, and finally drying the formed member.

3,897,260

NOVEL COATING COMPOSITION

Hiroshi Yaginuma, Yokohama; Takashi Suzuki, Yamato, and Atutane Kimi, Yokohama, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 264,466, June 20, 1972, abandoned. This application Feb. 25, 1974, Ser. No. 445,687
Int. Cl. C08f 37/18, 45/28
U.S. Cl. 106—287 R 4 Claims

1. A coating composition comprising 90–40 % by weight of liquid polybutadiene having at least 60 % cis-configuration and a number average molecular weight of 500–20000 and 10–60 % by weight of liquid polypentadiene prepared by polymerizing 1,3-pentadiene in a homogeneous system using a Friedel-Crafts catalyst having at least 70 % trans-configuration and a number average molecular weight of 500–20000.

3,897,261

HYDROUS OXIDE COATED TiO_2

Alvin Allen, Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

Filed Dec. 20, 1973, Ser. No. 426,474
Int. Cl. C09c 1/36, 3/00
U.S. Cl. 106—300 4 Claims

1. Process for treating pigmentary TiO_2 comprising

a. gradually adding to an aqueous slurry of said TiO_2 an alkaline solution of a soluble silicate in an amount to provide from about 1 to 4% silica, as SiO_2 and based on the weight of said TiO_2, the pH of said slurry being maintained below about 9 during silicate addition by introduction of acid thereby to precipitate the silica, the amount of said acid being insufficient to lower the pH below about 5,

b. gradually adding to the resultant slurry an alkaline solution of a soluble aluminum salt in an amount to provide from about 4 to 9% alumina, as Al_2O_3 and based on the weight of said TiO_2, the pH being maintained in the range of about 5 to 9 during aluminum salt addition by introduction of acid thereby to precipitate the alumina,

c. gradually adding to the resultant slurry an alkaline solution of a soluble silicate in an amount to provide from about 1 to 4% silica, as SiO_2 and based on the weight of said TiO_2, the pH being maintained in the range of about 5 to 9 during silicate addition by introduction of acid thereby to precipitate the silica, and

d. gradually adding to the resultant slurry an alkaline solution of a soluble aluminum salt in an amount to provide from about 4 to 9% alumina, as Al_2O_3 and based on the weight of said TiO_2, the pH being maintained in the range of about 5 to 9 during aluminum salt addition by introduction of acid thereby to precipitate the alumina.

3,897,262

SYRUP AND METHOD OF MANUFACTURING SAME

Paul O. Carlson, Hickory Corners, Mich., assignor to General Foods Corporation, White Plains, N.Y.

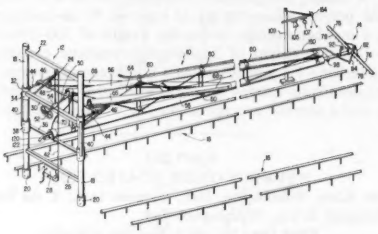
Filed Nov. 23, 1973, Ser. No. 418,330
Int. Cl. C13d 3/12; C13f 1/00, 3/00
U.S. Cl. 127—55 3 Claims

1. Process for preparing a table syrup which employs semi-refined sugar syrup as its principal constituent, said syrup being thickened with CMC, said process comprising preparing a concentrated, pasteurized, semi-refined sucrose syrup having a Brix of at least 68°, said syrup containing naturally occurring colloidal substances, filtering said syrup through a diatomaceous earth filter media to remove colloidally suspended mineral and organic residue contained therein, separately preparing a CMC solution from softened water having less than 5 parts per million calcium or magnesium, admixing the latter solution with the concentrated syrup to dilute the concentrate and produce an ultimate syrup having a CMC level of 0.15–0.25% by weight, and packaging the diluted syrup in a transparent container.

3,897,263
APPARATUS FOR WASHING AND DISINFECTING TRAILER OR VAN INTERIORS

Oliver Thurston Davis, and Norman R. Jones, both of Rt. 1, P.O. Box 22, Dunlap, Tenn. 37327

Filed Nov. 2, 1973, Ser. No. 412,467
Int. Cl. B60s *3/02*; B08b *3/00*
U.S. Cl. 134—45 8 Claims



1. An apparatus for washing and disinfecting the interiors of trailers and vans having an open and closed end, said apparatus comprising:
   a. a vertically extending mounting structure fixed at one end;
   b. a boom structure secured at one end to said mounting structure and extending in a substantially horizontal position;
   c. means secured to said mounting structure for moving said boom structure to a plurality of vertical elevations to accommodate interiors of varying heights;
   d. means secured to said mounting structure for positioning said boom structure at a plurality of angles with respect to the horizontal;
   e. outwardly biased extension means slidably positioned in the free end of said boom structure means for biasing said extension means outwardly;
   f. a source of washing fluid under pressure; and
   g. a washing head rotatably attached to said extension means and connected to said source of washing fluid, said washing head having spray forming means biased to direct said washing fluid generally downward and back toward said free end of said boom structure when said trailer is being freely backed onto and away from said boom structure and directed generally downward and away from said free end of said boom structure when said washing head is in engagement with said closed end of said trailer said outwardly biasing means of said extension means actint to return said extension means to its original position with respect to the boom structure after said rotatable washing head has disengaged the closed end of said trailer.

3,897,264
ELECTROCHEMICAL CELLS WITH INORGANIC OXYHALIDE OR THIOHALIDE SOLVENT

James J. Auborn, Groton, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 305,812, Nov. 13, 1972, abandoned. This application Nov. 28, 1973, Ser. No. 419,562
Int. Cl. H01m *35/00*
U.S. Cl. 136—6 LN 21 Claims

1. An electrochemical cell consisting essentially of an oxidizable active anode material; an active cathode material selected from the group consisting of halogens and metal halides; said active cathode material being the sole oxidant material in said cells; and an electrolytic solution between and in contact with said anode and cathode materials, said electrolytic solution consisting essentially of an inorganic solvent material and a solute dissolved therein, said inorganic solvent material selected from the group consisting of monofluorophosphoryl dichloride, monobromophosphoryl difluoride, dibromophosphoryl monofluoride, monofluorothiophosphoryl dichloride, thiophosphoryl chloride, monobromothiophosphoryl difluoride, dibromothiophosphoryl monofluoride, and mixtures thereof.

21. An electrochemical cell consisting of an oxidizable active anode material; an active cathode material selected from the group consisting of halogens and metal halides; and an electrolytic solution between and in contact with said anode and cathode materials, said electrolytic solution consisting of an inorganic solvent material and a solute dissolved therein, said inorganic solvent material selected from the group consisting of monofluorophosphoryl dichloride, monobromophosphoryl difluoride, dibromophosphoryl monofluoride, monofluorothiophosphoryl dichloride, thiophosphoryl chloride, monobromothiophosphoryl difluoride, dibromothiophosphoryl monofluoride, and mixtures thereof.

3,897,265
GAS DEPOLARIZED ELECTROCHEMICAL CELLS AND METHOD OF ASSEMBLY

Arthur M. Jaggard, Apple Valley, Minn., assignor to Gould Inc. St. Paul, Minn.

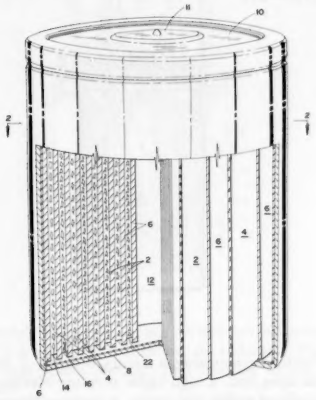
Filed Jan. 30, 1974, Ser. No. 437,924
Int. Cl. H01m *29/04*; H01m *1/02*
U.S. Cl. 136—86 A 24 Claims

1. A gas depolarized electrochemical cell comprising:
a first metal housing having a closed end and an open end, said closed end having an opening therein to allow gas to enter said first metal housing, said closed end of said first metal housing forming a first external electrical contact for said gas depolarized electrochemical cell, said first metal housing having means for fastening said first metal housing to a second metal housing;
a second metal housing having a closed end and an open end, said second metal housing having a region therein for receiving an anode material, said closed end of said second metal housing forming a second external electrical contact for said gas depolarized electrochemical cell; said second metal housing having means for fastening to said first metal housing;
a cathode assembly including an electrically conductive current collecting member, said current collecting member forming electrical contact with said first metal housing; a hydrophobic layer on one side of said cathode assembly and a separator on the opposite side of said cathode assembly;
a single insulating and sealing member having an L-shaped cross section shape, said insulating and sealing member having a first surface for forming sealing contact with said first metal housing, said insulating and sealing member having a second surface for forming sealing contact with said second metal housing; said insulating member having a third surface for abutting against and extending partially along said [a] cathode assembly to thereby firmly hold said cathode assembly against said metal housing;
anode material located in said second metal housing to form electrical contact with said second metal housing, said anode material located adjacent said separator; and an electrolyte in said gas depolarized electrochemical cell so that said second metal housing, said first metal housing, and said insulating and sealing member coact to simultaneously seal and maintain said first metal housing and said second metal housing in a leakproof electrolyte seal.

3,897,266
ALKALINE BATTERY CELL

John L. Devitt, Denver; Robert E. Stark, Littleton, and Leland M. Gillman, Denver, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Aug. 3, 1970, Ser. No. 60,432
Int. Cl. H01m 41/00
U.S. Cl. 136—30 2 Claims



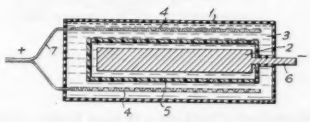
1. A high energy density alkaline, normally sealed rechargeable cell comprising:
a. at least one electropositive electrode comprising nickel compound as active material;
b. at least one electronegative active zinc-containing electrode disposed in spaced adjacent relationship to and in electrochemical communication with said positive electrode(s);
at least said electronegative electrode consists essentially of its active material pasted on collector grid substrate(s) of compatible conducting material to form pasted rigid or non-rigid electode plate(s), said electronegative electrode made smooth by pressure molding the paste to the supporting grid substrate;
c. an electrolyte-absorbing and retaining separator disposed between and in intimate contact with said opposite polarity electrodes, where that portion of the separator immediately adjacent the zinc-containing electrode is a material of substantially uniform microporosity and permeability within the entirety of any surface taken substantially parallel to the interface formed by the separator and zinc-containing electrode;
said zinc-containing electrode being substantially homogeneously wetted along its interface which is substantially free of occluded voids;
d. electrolyte absorbed and retained by said separator material to the extent that substantially no free electrolyte is present between the electrodes, but in extent sufficient to provide the homogeneous wetting of the negative electrode and sufficient to promote electrochemical conduction between the electrodes;
e. container encapsulating and constraining said electrodes and separator material and electrolyte under firm stacking pressure to form a self-supporting integral cell; and
f. means for withdrawing current from electrodes of opposite polarity within the cell.

2. A high energy density alkaline, normally sealed rechargeable cell comprising:
a. at least one electropositive electrode plate;
b. at least one electronegative active zinc-containing electrode plate disposed in spaced adjacent relationship to and in electrochemical communication with said positive electrode(s) plate;
c. an electrolyte-absorbing and retaining separator disposed between and in intimate contact with said opposite polarity electrodes, where that portion of the separator immediately adjacent the zinc-containing electrode is a material of substantially uniform microporosity and permeability within the entirety of any surface taken substantially parallel to the interface formed by the separator and zinc-containing electrode;
said zinc-containing electrode being substantially homogeneously wetted along its interface which is substantially free of occluded voids;
d. electrolyte absorbed and retained by said separator material to the extent that substantially no free electrolyte is present between the electrodes, but in extent sufficient to provide the homogeneous wetting of the negative electrode and sufficient to promote electrochemical conduction between the electrodes;
e. container encapsulating and constraining said electrodes and separator material and electrolyte under firm stacking stacking pressure to form a self-supporting integral cell;
a space being provided between a portion of the cell container and electrode plates to allow gas communication and recombination between the electrode plates;
f. means for withdrawing current from electrodes of opposite polarity within the cell.

3,897,267
ELECTROCHEMICAL CELLS

Alfred Chan Chung Tseung; Beatrice Yuck Chaan Wan, and Walter John King, all of London, England, assignors to National Research Development Corporation, London, England

Filed Oct. 19, 1970, Ser. No. 81,933
Claims priority, application United Kingdom, Oct. 20, 1969, 51401/69
Int. Cl. H01m 27/00
U.S. Cl. 136—86 A 8 Claims



1. A galvanic, metal/oxygen cell comprising anode and cathode components, barrier means between said components, said barrier means consisting of material which is relatively impermeable to oxygen and to larger molecules while permitting diffusion of hydroxyl ions therethrough, an electrolyte and a surrounding envelope of oxygen permeable material.

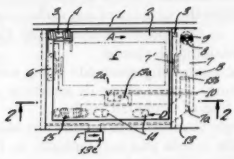
3,897,268
DRY CELL MAGAZINE

Keisuke Haraguchi, Kamifukuoka, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1974, Ser. No. 453,573
Claims priority, application Japan, Mar. 30, 1973, 48-38667
Int. Cl. H01m 1/04
U.S. Cl. 136—173 6 Claims

1. A dry cell magazine comprising:
a casing for receipt of said dry cell;
a cover member movably mounted within said casing;
a movable contact plate for engagement with said dry cell; and
means for retracting said contact plate from said engagement with said dry cell and for opening said cover member, said cover member has one edge having an arresting

groove which is in contact with said retracting and opening means when said cover member is in a closed position



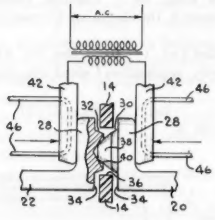
on said casing, said cover member being biased to pivot said one edge out of said contact with said retracting and opening means.

3,897,269

STORAGE BATTERY CONSTRUCTION AND METHOD OF MAKING SAME

Anthony Sabatino, and Daniel Orlando, both of Milwaukee, Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Aug. 21, 1961, Ser. No. 132,660
Int. Cl. H01m *5/00*
U.S. Cl. 136—176 **14 Claims**



1. The method of making a storage battery comprising the steps of:

providing an open top storage battery case having a partition of insulating material which divides the case into at least two separate compartments, said partition having an opening therethrough;

providing battery elements, said elements each including a connector strap thereon having a connector lug with a sealing face thereon, each connector lug having an integral projection of lead material thereon extending from the sealing face thereon;

positioning said battery elements in each of said compartments with said projections positioned in contact with each other through the opening in said partition wall, there being an area of reduced cross section at the area of contact;

passing an electric current through said projections to soften the contact portions of said projections into a deformable mass and cause them to fuse together;

compressing said connector lugs together when said projections are in a softened state to force the sealing faces of the connector lugs into sealing engagement with opposite sides of the partition wall; and

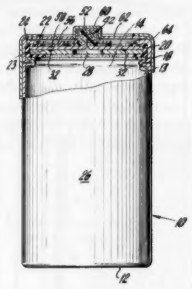
maintaining said connector lugs under compression for a period of time sufficient to allow said softened lead material to harden to a point where said sealing faces on said lugs will be permanently maintained in sealing engagement with the partition wall.

3,897,270

BATTERY CONSTRUCTION WITH IMPROVED TERMINAL ATTACHING STRUCTURE

Martin G. Rosansky, Monsey, N.Y., assignor to Power Conversion, Inc., Mount Vernon, N.Y.

Continuation-in-part of Ser. No. 327,937, Jan. 30, 1973, abandoned. This application Feb. 26, 1974, Ser. No. 445,887
Int. Cl.² H01M *2/12*
U.S. Cl. 136—177 **6 Claims**



1. A battery comprising a casing defining a cavity, and having an open end, a high vapor pressure electro-chemical system confined within said cavity, a partition disposed across said open end, an aluminum cover also disposed across said open end and spot welded to said partitions, and outwardly protruding cold welded seam formed on said cover, an epoxy resin coating said seam, an aluminum interconnecting member welded to said cover at a plurality of locations spaced from said seam and having an upstanding portion that covers said seam and includes one or more upstanding sidewalls, and a cap fitted over said upstanding portion and engaging the sidewalls thereof to form an electrical terminal, whereby said cover is peripherally deformed at a point most distant from said spot weld to release pressure in the event that a predetermined upper pressure limit is reached, or alternatively, said cover is peripherally deformed and said/spot weld is ruptured.

3,897,271

SELF-CONTAINED STATIC POWER SYSTEM

Chang-Kyo Kim, Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 117,370, Feb. 22, 1971, abandoned. This application Apr. 25, 1973, Ser. No. 354,616
Int. Cl.² G21H *1/10;* **H01L** *35/00*
U.S. Cl. 136—202 **9 Claims**

1. A self-contained static electric power generating system comprising:

a self-sustaining heat source;

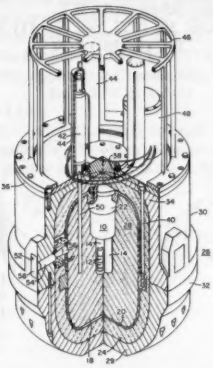
a housing completely surrounding and encapsulating said heat source;

means positioned external of said housing and responsive to the heat radiated by said heat source to generate an electrical output;

means thermally and statically coupling said heat source to a heat reservoir associated with said heat responsive means;

a hermetically sealed port formed integral with and through a wall of said housing and responsive to the heat radiated within said housing to unseal above a predetermined temperature level above the designed operating temperature of said heat source occurring as a result of a failure in operation of said thermal coupling means to transport a given designed quantity of heat from said heat source to said heat reservoir associated with said heat responsive means, to expose the interior of said housing to the exterior thereof; and

thermal insulation positioned between said housing and said heat source to reduce the amount of heat radiated through said housing to the exterior thereof, said thermal



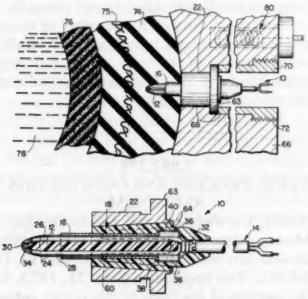
insulation fusing above the predetermined temperature level in a manner that enhances the radiation of heat from said heat source through said housing to the exterior thereof.

3,897,272

STURDY SENSING APPARATUS FOR MEASURING THE TEMPERATURE OF A HEATED RUBBER MATERIAL DURING ITS CURING PROCESS AND METHOD FOR MAKING SAME

Lewis A. Medlar, Oreland, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 29, 1974, Ser. No. 492,989
Int. Cl. G01k 1/14, 7/04, 11/04
U.S. Cl. 136—230 7 Claims



1. A method of constructing a durable temperature sensing apparatus for accurately measuring the temperature of a rubber material in a mold, including the steps of providing a probe having the same thermal characteristics as said rubber material and comprised of a first portion extending through said mold and a second portion extending into said rubber material, forming a passageway in said probe, inserting an electrically conductive temperature sensor into said passageway so that a temperature sensing end of said sensor forms an end portion of the second portion of said probe, providing a support sleeve extending along a part of the first and second portions of said probe, forming a two part insulator about a circumferential portion of said sleeve that extends along the first portion of said probe and wedging a rigid bushing over a portion of said insulator to retain the bushing in tight engagement with said sleeve.

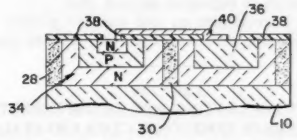
2. A durable temperature sensing apparatus adapted for mounting in a curing mold and into a material being heated therein to enable an accurate temperature of the material to be made without the heat of said mold affecting the temperature being sensed by said apparatus, said sensing apparatus comprising an insulating probe, said probe having a means to accommodate the positioning of an electrically conductive temperature sensing element in said probe, said electrically conductive temperature sensing element having a temperature sensing end portion positioned at an outer end surface of the probe that is insertable into said material, a rigid probe support sleeve, a first portion of said rigid sleeve being positioned about a first peripheral portion of said probe that is inserted into said material and a second portion of said sleeve being positioned about an adjacent peripheral portion of said probe that extends into said mold, two insulating housing members each positioned about said second portion of said sleeve and about the other end of said probe and sensing, element, and a bushing positioned about and in contact with said two insulating members to retain said sleeve and probe in fixed relation with respect to one another.

3,897,273

PROCESS FOR FORMING ELECTRICALLY ISOLATING HIGH RESISTIVITY REGIONS IN GaAs

Ogden J. Marsh, Woodland Hills, and Robert G. Hunsperger, Malibu, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 6, 1972, Ser. No. 304,028
Int. Cl. H01l 7/54
U.S. Cl. 148—1.5 13 Claims



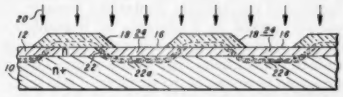
2. The process defined in claim 1 wherein said heavy ions are argon ions.

3,897,274

METHOD OF FABRICATING DIELECTRICALLY ISOLATED SEMICONDUCTOR STRUCTURES

Robert A. Stehlin; Richard J. Dexter; Don L. Kendall, and John M. Pankratz, all of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 148,760, June 1, 1971, abandoned. This application Mar. 12, 1973, Ser. No. 340,484
Int. Cl. H01l 7/54
U.S. Cl. 148—1.5 10 Claims

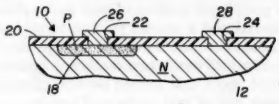


6. A method for producing a dielectrically isolated layer as set forth in claim 5, wherein said windows have bevelled walls.

3,897,275
PROCESS FOR FABRICATING SCHOTTKY BARRIER PHOTOTRANSISTOR

Sebastian R. Borrelo, Richardson, and Jimmy D. Sawyer, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 833,241, May 22, 1969, abandoned, and a continuation of Ser. No. 848,126, April 25, 1969, abandoned, said Ser. No. 833,241, is a continuation of Ser. No. 626,651, Jan. 25, 1967, abandoned. This application May 11, 1973, Ser. No. 359,586
Int. Cl. H01l 7/36
U.S. Cl. 148—1.5 16 Claims

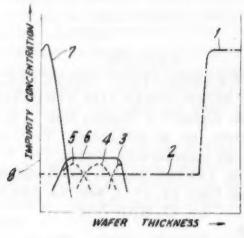


1. In a process for fabricating a phototransistor, the steps comprising:
- diffusing a p-type impurity into a predetermined area of a substrate of III-V compound semiconductor material of n-type to form a p-type region in said n-type substrate such that a photosensitive diode junction is provided between the p-type region and the n-type substrate,
- removing at least a portion of the substrate in said predetermined area comprising the p-type region to remove surface oxides therefrom and to reduce the level of p-type impurity concentration by exposing the p-type region at a depth having a sufficiently low impurity concentration for subsequent formation of a rectifying contact with a metal film to be deposited thereon, and
- depositing a metal film on said exposed portion of said p-type region to produce a rectifying junction therewith.

3,897,276
METHOD OF IMPLANTING IONS OF DIFFERENT MASS NUMBERS IN SEMICONDUCTOR CRYSTALS

Motoki Kondo, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed June 20, 1973, Ser. No. 371,619
Claims priority, application Japan, June 27, 1972, 47-64785
Int. Cl.[2] H01L 7/54
U.S. Cl. 148—1.5 6 Claims

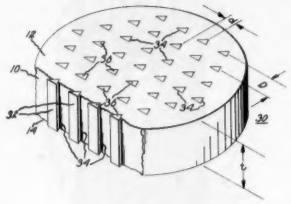


1. A method of successively implanting impurity ions in a semiconductor crystal in a plurality of implantation steps using different implantation conditions to form a region of a predetermined conductivity type over a preselected range of depths measured from one of the surfaces of said semiconductor crystal, said region having a plurality of layers including the steps of implanting impurity ions of a first relatively high mass number in the layer of said region spaced farthest from said one surface and implanting impurity ions of a second mass number lower than said first mass number in the layers of said region closer to said one surface.

3,897,277
HIGH ASPECT RATIO P-N JUNCTIONS BY THE THERMAL GRADIENT ZONE MELTING TECHNIQUE

Samuel M. Blumenfeld, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 30, 1973, Ser. No. 411,151
Int. Cl. H01l 7/34
U.S. Cl. 148—1.5 11 Claims



1. A process for making high aspect ratio P-N junctions comprising the process steps of:
- a. depositing a layer of metal of approximately 20 micron thickness on selected surface areas of one of two major opposed surfaces of a body of single crystal semiconductor material to form an array of metal buttons thereon;
- b. alloying each metal button to the surface disposed on
- c. heating the body and the metal array to an elevated temperature to form a melt of the metal of each button and the semiconductor material of the body immediately adjacent thereto;
- d. establishing a temperature gradient substantially perpendicular to the two opposed surfaces and substantially parallel to the vertical axis of the body, and
- e. migrating each melt through the body along the temperature gradient from the one to the other of the two major opposed surfaces to form a region of recrystallized semiconductor material of the body having solid solubility of the metal therein to impart a selective type conductivity and selective resistivity thereto.

3,897,278
OXIDIZING PROCESS AND COMPOSITION FOR ALUMINUM

Bertha S. Tuttle, Harwichport, and Jekabs Ozolins, Holliston, both of Mass., assignors to J. N. Tuttle, Inc., Medford, Mass.

Continuation-in-part of Ser. No. 170,668, Aug. 10, 1971, Pat. No. 3,765,952. This application Sept. 21, 1973, Ser. No. 399,753The portion of the term of this patent subsequent to Oct. 16, 1990, has been disclaimed.
Int. Cl. C23f 5/04
U.S. Cl. 148—6.1 18 Claims

13. In a process for coloring a substrate coated either with aluminum or an aluminum alloy including the step of cleaning the aluminum to the extent necessary, oxidizing the aluminum and contacting the aluminum with a colorant, the improvement comprising formation of said oxide coating by chemical means consisting of contacting the surface of said aluminum coating with an aqueous, alkaline solution of a ferricyanide salt, said solution consisting of at least 0.01 moles per liter of a ferricyanide, a pH adjustor in an amount sufficient to provide required pH and an inhibitor for aluminum to prevent darkening of the oxide coating, said aqueous alkaline solution of ferricyanide having a pH varying between about 7.5 and 13.5.

3,897,279
METHOD FOR THE PRODUCTION OF HIGH STRENGTH NOTCH TOUGH STEEL

Reginald N. Shaughnessy; Robert W. Witty, and Robert J. Ackert, all of Sault Sainte Marie, Canada, assignors to The Algoma Steel Corporation, Limited, Canada

Continuation-in-part of Ser. No. 253,897, May 16, 1972, abandoned. This application May 11, 1973, Ser. No. 359,423
Claims priority, application Canada, May 12, 1972, 147942
Int. Cl.² C21D *1/02*
U.S. Cl. 148—12 F **6 Claims**

1. A method of making a high strength steel of improved notch toughness below 0°F which comprises subjecting a fully killed steel consisting essentially of the following composition by weight:

carbon	0.02	to	0.20%
manganese	0.75	to	2.0%
columbium	0.015	to	0.18%
aluminum	0.02	to	0.10%
nickel	0	to	.0 %
chromium	0	to	1.0 %
copper	0	to	1.0 %
molybdenum	0	to	0.5 %
vanadium	0	to	0.12%
zirconium	0	to	.20%
rare earth metals	0	to	.06%
balance	iron and impurities		

to heating to at least 2100°F, and subsequently rolling said steel to continuously reduce the steel, without any substantial time delays, throughout the temperature range of from 1900° to 1700°F with at least a 50 percent reduction in section at below 1800°F, said steel having a uniform fine grain of an essentially ferritic grain structure with an average grain size of finer than 9.0 as determined by ASTM No. E 112.

3,897,280
METHOD FOR MANUFACTURING A STEEL SHEET AND PRODUCT OBTAINED THEREBY

Hisashi Gondo; Hiroshi Takechi; Tsuyoshi Kawano, all of Kisarazu, and Hiroaki Masui, Kimitsu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 11, 1973, Ser. No. 423,821
Claims priority, application Japan, Dec. 23, 1972, 47-128853; Dec. 23, 1972, 47-128854
Int. Cl.² C21D *9/48*
U.S. Cl. 148—12 C **14 Claims**

1. A method for manufacturing a steel sheet having an excellent press formability which comprises heating a killed steel composed of not more than 0.10% C, 0.05% to 1.0% Mn, 0.005% to 0.15% Al, at least one member of the group consisting of Ti, Nb and Zr, and the rest Fe and unavoidable impurities, the Ti%/4 + Nb%/7.8 + Zr%/7.6 being more than the C % in the steel, subjecting the same to hot rolling such that the finishing temperature is 750°C or less, and thereafter effecting a treatment for recrystallization.

3,897,281
METHOD FOR EPITAXIALLY GROWING A SEMICONDUCTOR MATERIAL ON A SUBSTRATE FROM THE LIQUID PHASE

Stephen Lee Gilbert, Newtown, Pa., and Michael Ettenberg, Freehold, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 9, 1972, Ser. No. 224,758
Int. Cl.² H01L *7/38*
U.S. Cl. 148—171 **8 Claims**

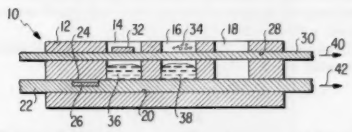
1. A method of depositing on a substrate an epitaxial layer of single crystalline semiconductor material comprising the steps of:

providing in a boat the substrate, the semiconductor material, and a charge of a solvent for the semiconductor material which charge is separated from and below the semiconductor material,

placing the boat in means for providing a controlled atmosphere and/or at a controlled temperature,

heating the solvent to a temperature at which the solvent is molten and the semiconductor material will dissolve in the solvent,

dropping into the molten solvent, without removing the boat from the controlled atmosphere and/or temperature



means, the semiconductor material in an amount sufficient to saturate the solvent with the semiconductor material, then

bringing a surface of the substrate into contact with the saturated molten solvent, and then

cooling the saturated molten solvent sufficiently to deposit an epitaxial layer of the semiconductor material on the substrate.

3,897,282
METHOD OF FORMING SILICON GATE DEVICE STRUCTURES WITH TWO OR MORE GATE LEVELS

James Judson White, Kanata, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Oct. 17, 1972, Ser. No. 298,364
Int. Cl.² H01L *21/20, 21/28, 29/78, 27/02*
U.S. Cl. 148—175 **20 Claims**

1. A method of producing a semiconductor device on a substrate, the device having at least two layers of polycrystalline silicon at different levels relative to the substrate, an edge of one layer at least substantially coincident with an edge of another layer, comprising:

a. forming a layer of field oxide on a surface of a single crystal substrate and defining a window of exposed substrate at a predetermined position for forming at least one device;

b. growing a layer of gate oxide on the exposed surface of said substrate in said window;

c. depositing a first layer of polycrystalline silicon on said layer of gate oxide and the exposed surface of said field oxide;

d. forming a layer to form a first masking layer on said first layer of polycrystalline silicon;

e. etching said first masking layer and said first polycrystalline silicon layer to form separated portions of said first polycrystalline silicon layer at predetermined positions;

f. thermally oxidizing the structure to form an oxide layer encompassing said portion of said first polycrystalline silicon layer, said oxide layer incorporating unmasked regions of said gate oxide layer and extending into said substrate at unmasked regions of said substrate;

g. depositing a second layer of polycrystalline silicon on said oxide layer formed in (*f*) and on the exposed surface of said field oxide;

h. forming a further layer to form a second masking layer, on said second layer of polycrystalline silicon;

i. etching sequentially said second masking layer and said second polycrystalline silicon layer and said oxide layer to form and uncover at least one portion of said second polycrystalline layer in a predetermined positioned rela-

tionship with said separated portions of said first polycrystalline silicon layer for formation of said device; to uncover at least a major part of said separate portion of said first layer of polycrystalline silicon; and to uncover said substrate at positions not masked by said field oxide layer and polycrystalline silicon layers;

j. doping unmasked portions of said polycrystalline silicon layers and simultaneously doping said substrate at said uncovered areas to form source and drain areas associated with said device as required;

k. forming a dielectric layer on each of said devices, and

l. forming electrical contact areas.

3,897,283

PLASTIC BONDED EXPLOSIVE COMPOSITION

Ethyl F. Wiebke, and Charles W. Falterman, both of China Lake, Calif., assignors to The United States of Amercia as represented by the Secretary of the Navy, Washington, D.C.

Filed May 19, 1967, Ser. No. 642,651
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.5 **3 Claims**

1. The plastic bonded explosive composition consisting essentially of

Ingredients	Percent by weight
A high explosive	83
Binder	17

said explosive being a member selected from the group consisting of cyclotetramethylenetetranitramine, cyclotrimethylenetrinitramine, and diaminotrinitrobenzene;

said binder consisting of 42.4% of a blend of the reaction products of adipic acid, maleic acid with diethylene glycol and phthalic acid, maleic acid with propylene glycol; 33.1% vinyl toluene; 2% alpha-methyl styrene; and 22.5% diallyl phthalate.

3,897,284

TAGGING EXPLOSIVES WITH ORGANIC MICROPARTICLES

Richard G. Livesay, White Bear Twp., Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 139,012, April 30, 1971, Pat. No. 3,772,200. This application Sept. 18, 1973, Ser. No. 398,569
Int. Cl. C06b *3/02*
U.S. Cl. 149—21 **17 Claims**

1. An explosive composition, comprising

A. explosive material; and

B. microparticles of a tack-free organic carrier which does not have a softening point below 60°C, which microparticles have a generally spheroidal shape with a diametrical dimension of not less than one nor more than 250 micrometers, contain tagging elements in uniform amoungs of at least 0.1 percent of the total weight, survive detonation of the explosive material and so permit retrospective identification of the explosive although it has been detonated.

3,897,285

PYROTECHNIC FORMULATION WITH FREE OXYGEN CONSUMPTION

Brian K. Hamilton, and Eugene F. Garner, both of Saugus, Calif., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 10, 1973, Ser. No. 395,480
Int. Cl. C06b *15/00*
U.S. Cl. 149—41 **11 Claims**

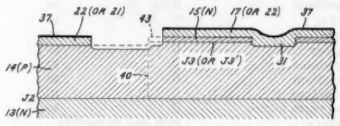
1. A pyrotechnic composition adapted, upon combustion, for generating a low-flame temperature, non-toxic gas, said composition prior to combustion comprising: a fuel; a metal carbonate selected from the group consisting of nickel carbonate and magnesium carbonate which acts as a coolant; and an inorganic oxidizer selected from the group consisting of a metal chlorate, a metal perchlorate, a metal nitrate, ammonium chlorate, ammonium perchlorate and ammonium nitrate.

3,897,286

METHOD OF ALIGNING EDGES OF EMITTER AND ITS METALIZATION IN A SEMICONDUCTOR DEVICE

Angelo L. De Cecco, Newtown Square; Robert E. Hysell, Berwyn, and Dante E. Piccone, Philadelphia, all of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed June 21, 1974, Ser. No. 481,733
Int. Cl. H01l *7/50*
U.S. Cl. 156—11 **18 Claims**



1. In a method of making a semiconductor device including a broad area, multi-layer semiconductor wafer comprising at least a base layer having first and second laterally adjoining regions of one conductivity type and a thin emitter layer of a different conductivity type superimposed on said first region of the base layer with which it forms a rectifying junction, the improvement comprising the steps of:

a. connecting a metallic contact to the outer face of said emitter layer except for a relatively small area of said face, adjacent to at least part of the border between said first and second regions of said base layer, from which said contact is omitted to avoid short circuiting said rectifying junction in the vicinity of said border; and then

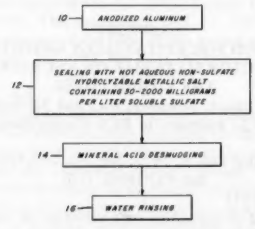
b. removing entirely the portion of said emitter layer that was disposed under said area.

3,897,287

METHOD OF SEALING AND DESMUDGING OF ANODIZED ALUMINUM

Raymond J. Meyer, Apollo; Ford Simpson, Jr., Lower Burrell, and Michael P. Boland, North Washington Twp., Westmoreland County, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 11, 1972, Ser. No. 279,821
Int. Cl. C23c *3/00;* **C23f** *13/00*
U.S. Cl. 156—22 **8 Claims**



8. In a process for sealing and desmudging anodized aluminum, the improvement which comprises:

a. sealing said anodized aluminum in a bath consisting essentially of:

1. water,
2. at least one non-sulfate hydrolyzable metal salt selected from the group consisting of nickel acetate and cobalt acetate comprising at least about 1 g/l of said sealing bath, and
3. 375–2,000 ppm soluble sulfate selected from the group consisting of sulfuric acid, nickel sulfate, aluminum sulfate, and sodium sulfate, and

b. thereafter removing smudge formed on said anodized aluminum by said sealing by treating same with a solution consisting essentially of:
1. water, and
2. at least about 15% by weight of a mineral acid selected from the group consisting of nitric, hydrochloric, sulfuric, phosphoric, and chromic acid,

without adversely affecting the seal produced by said sealing.

3,897,288

FASTENING METHOD USING POLYMER-BASED MAGNETS

Richard E. Fayling, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 846,448, July 31, 1969, abandoned. This application June 1, 1971, Ser. No. 148,991
Int. Cl. B29e *27/00*
U.S. Cl. 156—60 **4 Claims**

1. A method for forming a long narrow adhesive bond fastening at least two magnetizable articles together comprising 1) disposing reactive adhesive material between the articles that cures to form said adhesive bond; concurrently 2) disposing a discrete flexible self-supporting polymer-based magnet in elongated strip form adjacent a substantial length of the articles and adjacent but not bonded to a substantial length of the adhesive material between the articles; 3) arranging the articles so that portions of the articles are joined to form a physical link of magnetizable material extending continuously from one pole to the opposite pole of the magnet except where interrupted by adhesive material, whereby opposite magnetic poles occur at opposite sides of the adhesive material, magnetic lines of force are concentrated through the adhesive material, and a magnetically stable arrangement is formed in which a magnetic force draws the articles toward one another to place the adhesive material under compression; and (4) removing the magnet from its position after the articles are fastened together.

3,897,289

METHOD OF FORMING WIRE WOVEN FABRIC FOR PNEUMATIC TIRES

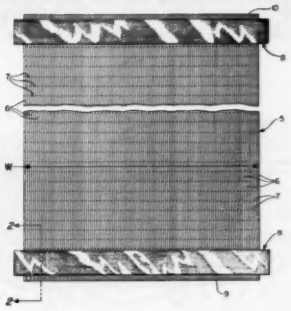
Samuel J. Di Paola, Burton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 69,195, Sept. 3, 1970. This application May 22, 1972, Ser. No. 255,840
Int. Cl. D03d *47/50*
U.S. Cl. 156—88 **10 Claims**

1. A method of forming a length of tire cord fabric having parallel longitudinal sides and opposing ends, comprising:

a. plain weaving together metal warp cords composed of individual wires having a diameter greater than 0.003 inches, and textile weft threads having a denier of at least 200, such that the metal warp cords extend longitudinally of the fabric; and

b. securing at least one separate piece of stiffening material transversely across the metal warp cords adjacent each of the opposing ends of the fabric, the material composed of plain woven textile warp cords and weft threads, the pieces of stiffening material being secured to the fabric



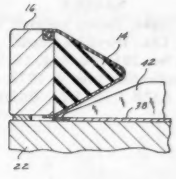
such that the textile warp cords are angularly disposed to the metal warp cords.

3,897,290

METHOD OF RESURFACING A BILLIARD TABLE

Herbert C. Haller, Newtonville, N.Y., assignor to Albany International Corporation, Albany, N.Y.

Filed Feb. 13, 1974, Ser. No. 442,049
Int. Cl. B32b *35/00*
U.S. Cl. 156—98 **7 Claims**



1. A method of resurfacing a billiard table of the type having a playing surface surrounded by cushions within a rail, said cushions including portions overlying said playing surface, said method comprising the steps of:

a. removing the existing fabric on the playing surface of the table;

b. pre-cutting a replacement fabric to a size corresponding to the playing surface of the table;

c. affixing one side of a double-faced adhesive tape about the periphery of the playing surface beneath the cushion so that no billiard ball can roll over the tape; and,

d. affixing the other side of said double-faced adhesive tape to the underside of said replacement fabric.

3,897,291

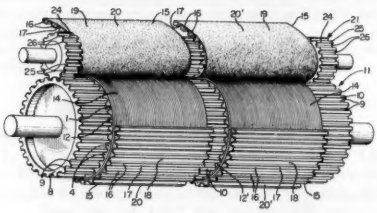
METHOD AND ASSEMBLY FOR MAKING A POWER TRANSMISSION BELT AND BELT MADE THEREBY

Ronald D. Hoback, and Joseph C. Geist, both of Lincoln, Nebr., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 1, 1973, Ser. No. 337,056
Int. Cl. B29h *1/22*
U.S. Cl. 156—138 **11 Claims**

11. In a method of manufacturing a toothed power transmission belt including the steps of forming a first toothed belt portion by means of pressure in the absence of any appreciable degree of curing or vulcanization with said first belt portion having a fabric facing, applying said first belt portion to a generally cylindrically shaped mandrel provided with grooves extending axially thereof, the teeth of said first

toothed belt portion lying in the grooves of said mandrel, splicing the ends of said first toothed belt portion to form an endless band, maintaining said first and second portions in a generally cylindrical disposition while aligning the teeth of said second portion in a predetermined position relative to the



teeth of said first portion and retaining the configuration of the teeth of said second portion relative to the teeth of said first portion; and curing the previously formed first and second portions into a molded integral belt structure having teeth on opposite surfaces thereof.

3,897,292

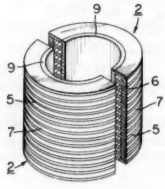
METHOD OF PRODUCING A PRINTING MAGNETIC SADDLE

Yasuo Fukuyama, Osaka, Japan, assignor to Yamauchi Rubber Industry Co., Ltd., Hirakata, Japan

Division of Ser. No. 281,642, Aug. 18, 1972, Pat. No. 3,824,926. This application June 4, 1973, Ser. No. 366,722

Int. Cl.[2] B32B *1/10, 5/12;* **B65H** *81/08*

U.S. Cl. 156—153 **4 Claims**



1. A method of producing a magnetic saddle for use on a printing cylinder in printing, which comprises: winding a fibrous layer impregnated with a thermosetting resin round an iron core for molding purposes; hardening said fibrous layer by heating; grinding the external surface of the hardened fibrous layer to form a non-magnetic cylinder; piling up a plurality of ring-shaped yokes having an inside diameter almost equal to the outside diameter of said cylinder by fitting said yokes on the cylinder one after another with a layer of magnets between each pair of yokes wherein said layer of magnets comprises a plurality of small block-shaped magnets circumferentially disposed at regular intervals along the sides of the adjacent pair of yokes; fitting a cylindrical outer mold having the inside diameter slightly larger than the outside diameter of said yoke on the circumference of the pile of yokes; pouring a liquid thermosetting resin into said outer mold so as to fill all the gaps between the magnets and the yokes; hardening the thus filled liquid resin by heating; removing the outer mold; and cutting the molded product along the axial direction into the prescribed number of saddles.

3,897,293

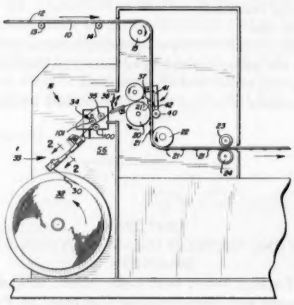
METHOD FOR APPLYING ADHESIVE TAPE TABS TO A DISPOSABLE DIAPER

Donald Babcock, Oak Lawn, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 10, 1973, Ser. No. 387,577

Int. Cl. B32b *31/10*

U.S. Cl. 156—227 **7 Claims**



1. A method for providing adhesive tape tabs on a disposable diaper from a roll of a laminar assembly of a substrate material and a release sheet material held together by a layer of a tacky, pressure-sensitive adhesive which comprises: unwinding said roll and paying out said laminar assembly therefrom; separating an edge portion of said release sheet from said laminar assembly at an unwound portion thereof; folding back said separated portion of said release sheet into overlying relationship to an unseparated portion thereof to thereby expose a portion of said adhesive layer as an adhesive coating on said substrate by directing said laminar assembly along a concave support surface, providing a folding plate corresponding in curvature to said support surface and having a width generally corresponding to the width of said unseparated portion of the release sheet, positioning said plate in juxtaposition with said support surface at one side thereof above the path of said unseparated portion of the release sheet, and directing said separated portion of the release sheet about the inner edge of said plate; severing end segments of said laminar assembly; spacing said severed end segments from each other by distances corresponding to diaper lengths; and pressing said severed end segments against a moving web of water-impervious material at a marginal side portion thereof to adhere said end segments to said web by said adhesive coating on said substrate.

3,897,294

METHOD OF FORMING A PARABOLIC ANTENNA

William L. MacTurk, Claremont, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed May 6, 1974, Ser. No. 467,034

Int. Cl.[2] H01P *11/00*

U.S. Cl. 156—245 **17 Claims**

1. A method of forming a parabolic antenna comprising the steps of:

molding a concave epoxy paraboloid mold;

disposing a parabolic reflector blank over the concave epoxy paraboloid mold;

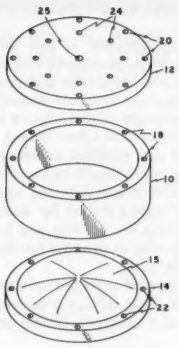
pressure forming the parabolic reflector blank into the concave epoxy paraboloid mold to form a parabolic reflector;

molding an antenna mounting plate;

forming a plastic collar for the parabolic reflector;

bonding the antenna mounting plate to the plastic collar;

assembling the parabolic reflector together with the plastic collar and mounting plate; and



inserting a plastic material between the parabolic reflector and the bonded plastic collar and mounting plate.

3,897,295
IONIZING RADIATION METHOD FOR FORMING ACRYLIC PRESSURE SENSITIVE ADHESIVES AND COATED SUBSTRATES

Rostyslaw Dowbenko, and Roger M. Christenson, both of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 791,764, Jan. 16, 1969, abandoned. This application June 2, 1972, Ser. No. 259,318

Int. Cl. C09j *7/04;* **B29c** *27/14;* **B44d** *1/50*

U.S. Cl. 156—272 **12 Claims**

1. The method of forming a pressure-sensitive adhesive which comprises applying to a release paper a layer of an essentially solventless syrup of from about 50 percent to about 98 percent by weight of

1. a monomer selected from the class consisting of alkyl acrylates, hydroxyalkyl acrylates, alkoxyalkyl acrylates, cyanoalkyl acrylates, alkyl methacrylates, hydroxyalkyl methacrylates, alkoxyalkyl methacrylates, cyanoalkyl methacrylates, N-alkoxymethylacrylamides and N-alkoxymethylmethacrylamides, and from about 2 percent to about 50 percent by weight of
2. a polymer of the group consisting of homopolymers and copolymers of alkyl acrylates, hydroxyalkyl acrylates, alkoxyalkyl acrylates, cyanoalkyl acrylates, alkyl methacrylates, hydroxyalkyl methacrylates, alkoxyalkyl methacrylates, cyanoalkyl methacrylates, acrylamides, methacrylamides, N-alkoxymethylacrylamides, N-(substituted alkyl)acrylamides, N-(substituted alkyl) methacrylamides, alkyl acrylamides, alkyl methacrylamides, and N-alkoxymethylmethacrylamides; and subjecting the substrate and coating to a total dosage of high energy ionizing irradiation from about 2 to about 20 megarads and transferring the film from the release paper whereby a permenently tacky pressure-sensitive adhesive is formed.

3,897,296
THERMAL WELDING OF PLASTIC

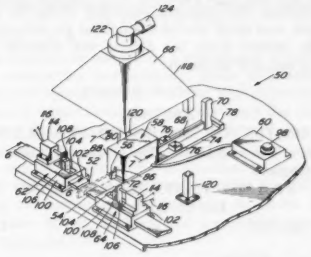
John E. Waldrum, Ambler, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed July 12, 1973, Ser. No. 378,767

Int. Cl. B29c *19/00*

U.S. Cl. 156—304 **33 Claims**

1. A method of welding two plastic body portions having oxidized surfaces together at a predetermined area of each of said surfaces, said oxidized surfaces being capable of being liquified, comprising: juxtaposing the areas of said surfaces, heating the juxtaposed surface areas to a temperature approaching the flashpoint of the plastic surfaces quickly to liquify said surface areas, without appreciably softening the plastic of the body portions contiguously underneath said



areas, removing a thin layer of substantially all of the liquified surface area of each body portion to expose unoxidized surfaces therebeneath and immediately thereafter bringing said unoxidized surfaces into abutment with one another.

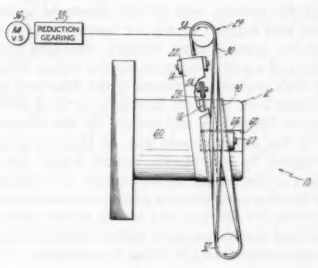
3,897,297
TUBULAR ARTICLE FORMING APPARATUS

Norman J. Perusse, and William E. Rejeski, both of Farmington, Conn., assignors to The Wiremold Company, West Hartford, Conn.

Filed Sept. 12, 1973, Ser. No. 396,529

Int. Cl. B31c *1/00, 5/00*

U.S. Cl. 156—428 **11 Claims**



1. In a tubular article forming apparatus for forming a tubular article of elongated generally helically coiled material and having a mandrel assembly for supporting the material for forward movement along a generally helical path therearound for helically coiling the material into a tubular article, the improvement wherein the mandrel assembly comprises an internal endless support belt for internally supporting the tubular article material, a support mandrel supporting the support belt for forward generally helical movement around the support mandrel along a generally helical path from a first relatively rearward point to a second relatively forward point of the helical path of the support belt, and internal guide roll means mounted on the support mandrel radially internally of said generally helical path of said material for supporting and guiding the endless support belt for continuous movement from said forward point to said rearward point radially internally of said generally helical path of the material, the internal guide roll means and support mandrel supporting the endless belt for unimpeded continuous movement along said generally helical path of the support belt for supporting said material for forward movement along its generally helical path around the mandrel assembly; and wherein the tubular article forming apparatus comprises an external belt assembly having an

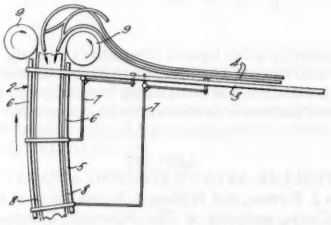
external endless belt extending generally helically around the mandrel assembly along a generally helically path thereof extending along at least part of the generally helical path of the support belt for gripping and supporting said material therebetween and carrying the material forwardly generally helically around the mandrel assembly along its generally helical path, and drive means connected for driving at least one of the endless belts for driving the material helically around the mandrel assembly.

3,897,298

APPARATUS FOR MAKING FOAM BUILDINGS

Robert Gray, The Old House, The Square, Yarmouth, Isle of Wight, England

Filed Mar. 5, 1973, Ser. No. 338,288
Int. Cl. B28b *1/32*
U.S. Cl. 156—500 **12 Claims**



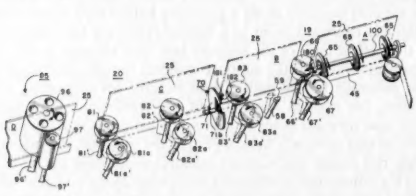
1. Apparatus for constructing a domed building of polyurethane foam, comprising support means and movable nozzle means, said movable nozzle means having an exit means, means for moving said nozzle means at a controlled rate around said support means for forming said domed building, means for passing foam forming reactants into said nozzle means, and a pair of elongate shutter means movable continuously with said nozzle means in the direction of their length and comprising inwardly facing surfaces of double curvature which conforms with and defines the thickness of the domed wall of the building, said pair of shutters being capable of articulation by articulation means within the depth of the shutters in the length of the domed wall whereby when the foam forming reactants are passed into said nozzle means and the means for moving said nozzle means moves said nozzle means and shutter means at said controlled rate a stable foam forming a wall of said building is produced.

3,897,299

ENCODABLE STRIP ATTACHMENT APPARATUS

Ronald J. Crouse, Richardson; Thomas Q. LeBrun, Dallas; Floyd E. Sill, Richardson, and Merle J. Volding, Dallas, all of Tex., assignors to Banctec, Incorporated, Dallas, Tex.

Filed Nov. 7, 1973, Ser. No. 413,599
Int. Cl. B32b *31/00*
U.S. Cl. 156—522 **49 Claims**



1. Apparatus for the attachment of a strip of encodable material to a document, said apparatus comprising:

a. first means for retaining at a supply station a continuous supply of encodable material of the type having an encodable band portion and a heat activatable adhesive bearing portion and supplying said encodable material to an alignment station,

b. second means disposed at said alignment station for initially aligning said document with said encodable material and thereafter attaching said heat activatable adhesive bearing portion with said document along at least a portion of the length of the edge of the document,

c. third means disposed at a final sealing station for effecting the sealing of said attached adhesive bearing portion to and along the entire length of the said document edge,

d. fourth means disposed between said alignment station and said final sealing station for severing said encodable material adjacent the leading and trailing edge of said document, thereby to produce an encodable strip modified document, and

e. fifth means disposed at an output station for transporting said encodable strip modified document into a stacking relationship with other encodable strip modified documents.

3,897,300

PAPER FILLED WITH A BLUSHED PARTICULATE POLYSTYRENE PIGMENT

Harry F. Kohne, Jr., Glenwood, and Frederick L. Kurrle, Laurel, both of Md., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 196,199, Nov. 5, 1971, Pat. No. 3,775,353.
This application Aug. 15, 1973, Ser. No. 388,369
Int. Cl.[2] O21H *3/40*
U.S. Cl. 162—169 **1 Claim**

1. Paper comprising cellulosic fibers and a synthetic, blushed polystyrene pigment filler prepared from a polystyrene emulsion, said blushed polystyrene pigment filler consisting essentially of spherical particles having an air-containing microporous structure as a result of air-solid interfaces within the filler particles and having a particle size of from about 0.1 to 0.2 micron and a scattering coefficient of about 0.64, said blushed polystyrene pigment being capable of increasing the B&L Opacity of a sheet of paper having an opacity of about 71 without said pigment by about 8 points when said paper is provided with about 4.66% by weight of said blushed pigment.

3,897,301

RECOVERY OF PAPERMAKING SOLIDS FOR REUSE, WITH AN ACTIVE CHLORINE-BEARING CHEMICAL

Harry D. Bauman, Glen Rock, and L. Richmond Lutz, III, York, both of Pa., assignors to P. H. Glatfelter Co., Spring Grove, Pa.

Filed Apr. 1, 1974, Ser. No. 456,770
Int. Cl.[2] D21F *1/66*
U.S. Cl. 162—189 **4 Claims**

1. The process which comprises separating an admixture of water, long fibers, fiber-fines and inorganic fillers from the sewage of a papermaking process, partially dewatering said admixture to a water content of from about 5 percent to about 25 percent solids, and reacting said admixture at ambient temperature under gentle agitation for from about 4 hours to about 72 hours with enough active chlorine-bearing chemical to provide from about 10 to 50 grams of active chlorine per pound of solids in said admixture whereby the drainage rate of said admixture is improved.

3,897,302

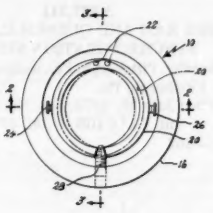
MELTABLE PLUG RADIATION SWITCH

Joseph R. Klein, Bethpage, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 747,780, July 22, 1968, abandoned. This application Aug. 12, 1969, Ser. No. 851,149

Int. Cl. G21c 7/10

U.S. Cl. 176—86 M 5 Claims



1. A meltable plug radiation switch comprising a case, a spring in the form of an annular split ring fixedly secured to said case, a pair of contacts located adjacent said spring, said spring being biased into contact with said pair of contacts by a meltable plug, whereby melting of said plug allows said spring to move out of contact with said pair of contacts.

3,897,303

INTEGRATED PROCESS OF AMMONIA PRODUCTION AND BIOSYNTHESIS

Fred T. Sherk, and Donald O. Hitzman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 23, 1974, Ser. No. 435,973

Int. Cl. C12b 1/00

U.S. Cl. 195—27 2 Claims

1. A process which comprises subjecting methane to partial oxidation in the presence of air, removing water-soluble products of said oxidation including methanol and formaldehyde, subjecting said water-soluble oxidation products to microbial fermentation, recovering a proteinaceous cellular product from said fermentation, passing non-water soluble gaseous products of said oxidation to an ammonia synthesis operation, and recycling at least a portion of ammonia from said synthesis operation to said microbial fermentation.

3,897,304

METHOD FOR CULTIVATION OF MICROORGANISMS

Nagamasa Sassa, Hyogo; Tarou Suzuki, Tokyo; Yoshihiro Kohchi, Hyogo, and Shigeyuki Kubota, Osaka, all of Japan, assignors to Kanegafuchi Chemical Industries Co., Ltd., Osaka, Japan

Filed June 11, 1973, Ser. No. 368,788

Claims priority, application Japan, June 12, 1972, 47-58811

Int. Cl. C12b 1/00

U.S. Cl. 195—28 R 15 Claims

1. In a method for the aerobic cultivation of a microorganism in a culture medium containing one or more normal paraffins as the sole carbon source, the improvement comprising conducting the cultivation in the presence of one or more polyoxypropylene glycol diethers, said diethers having the formula

$$R—O—(PO)_n—R^1$$

wherein R and R_1 may be the same or different and each represents a saturated alcohol residue having 1 to 30 carbon atoms from a single alcohol or a mixture of different alcohols and $(PO)_n$ represents a polyoxypropylene oxide residue, said diether having an average molecular weight of from 500 to 5,000.

3,897,305

PROCESS FOR PRODUCING DEXTROSE

Thomas L. Hurst, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation of Ser. No. 755,093, Aug. 26, 1968, abandoned. This application Dec. 17, 1973, Ser. No. 425,665

Int. Cl. C12b 1/00

U.S. Cl. 195—31 R 20 Claims

1. In a process for producing a conversion syrup of a high dextrose content by saccharifying, under acid conditions, a thinned starch hydrolyzate to dextrose with glucoamylase, the improvement which comprises saccharifying the thinned hydrolyzate to dextrose at pH between 5.0 and 6.7 in the presence of an enzyme system comprising glucoamylase and an effective amount of amylo-1,6-glucosidase to hydrolyze 1,6-glucosidic linkages of the hydrolyzate with the saccharification being conducted at a pH sufficient to inhibit the reversionary action of glucoamylase and thereby obtain improved yields of dextrose.

3,897,306

7-HYDROXY-Δ^8-TETRAHYDROCANNABINOLS AND MICROBIOLOGICAL PRODUCTION THEREOF

Hans-Jorg Vidic; Klaus Kieslich, and Karl Petzoldt, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

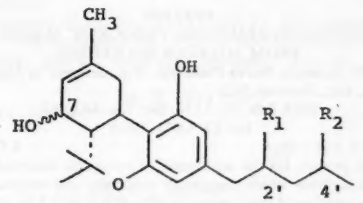
Filed July 3, 1974, Ser. No. 485,640

Claims priority, application Germany, July 6, 1973, 2335136

Int. Cl. C12d 13/00

U.S. Cl. 195—51 R 10 Claims

1. A process for the production of Δ^8-tetrahydrocannabinols of the formula



wherein R_1 and R_2 each are hydrogen atoms or one is a hydrogen atom and the other is a hydroxy, which comprises subjecting a corresponding 7-desoxy-Δ^8-tetrahydrocannabinol to the oxygenating activity of a microorganism of the genus Streptomyces or Pellicularia.

3,897,307

STABILIZED DRY CULTURES OF LACTIC ACID-PRODUCING BACTERIA

Randolph S. Porubcan, West Allis, and Robert L. Sellars, Waukesha, both of Wis., assignors to Chr. Hansen's Laboratory, Inc., Milwaukee, Wis.

Filed Oct. 23, 1974, Ser. No. 517,371

Int. Cl. C12k 1/00

U.S. Cl. 195—59 17 Claims

1. Stabilized dried culture medium solids providing a concentrate of viable harmless lactic acid-producing bacteria cells, said solids having been prepared by drying a fermented culture containing said cells together with other solids present on completion of the incubation of a culture of said cells in an aqueous nutrient-containing medium, said medium having been dried to a moisture content of below 5% by weight after the pH thereof has been adjusted to a pH favorable to the stability of said cells on drying, wherein the improvement is characterized by having present in said solids a combination

of stabilization potentiators comprising (a) an ascorbate compound selected from L-ascorbic acid and the edible water-soluble salts thereof, and (b) a second potentiator selected from the class consisting of glutamic acid, aspartic acid, and the edible water-soluble salts thereof, said potentiators having been dissolved in said fermented culture for effective contact with said cells before said drying, and in amounts for said ascorbate compound equivalent on a molar basis to 4 to 20 parts by weight L-ascorbic acid and for said second potentiator to 1.5 to 20 parts by weight of monosodium glutamate per each 100 parts of the moisture-free combined weight of said cells and said other fermentation solids.

3,897,308
IMMOBILIZED ENZYMES AND METHOD FOR PREPARATION

Norman N. Li, Edison, N.J.; Donald R. Brusca, Falls Church, Va., and Raam R. Mohan, Berkeley Heights, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 141,367, May 7, 1971, Pat. No. 3,740,315. This application Apr. 23, 1973, Ser. No. 353,822
Claims priority, application Italy, May 2, 1972, 4999/72
Int. Cl. C07g *7/02*
U.S. Cl. 195—63 **2 Claims**

1. An immobilized enzyme comprising an aqueous solution of the enzyme emulsified in an immiscible liquid which immiscible liquid comprises a hydrocarbon or a fluorinated hydrocarbon diluent and further wherein the immiscible liquid comprises a surfactant which is from about 0.01 to 10 weight percent of said immiscible liquid, the immobilized enzyme being selected from the group consisting of phenol oxidase, nitrate reductase and urease.

3,897,309
PROCESS FOR REMOVING PYROGENIC MATERIAL FROM AQUEOUS SOLUTIONS

Roy W. Grabner, North Plainfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

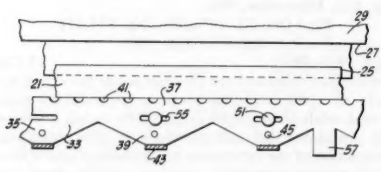
Filed Feb. 15, 1974, Ser. No. 443,063
Int. Cl. C07g *7/028*
U.S. Cl. 195—66 A **5 Claims**

1. A process for the separation of pyrogenic material from L-asparaginase which comprises dissolving said enzyme in a buffer solution of ionic strength of from 0.1 to 0.2 m. at a pH of from 7.0 to 7.5, passing the enzyme solution through a column of diethylaminoethyl dextran gel equilibrated with said buffer solution, and eluting the L-asparaginase from the column with said buffer solution.

3,897,310
COKE OVEN DOOR

Linwood G. Tucker, Pittsburgh, Pa., assignor to Koppers Company Inc., Pittsburgh, Pa.

Filed Mar. 7, 1974, Ser. No. 448,960
Int. Cl.² C10B *1/06, 25/06, 25/24*
U.S. Cl. 202—248 **2 Claims**

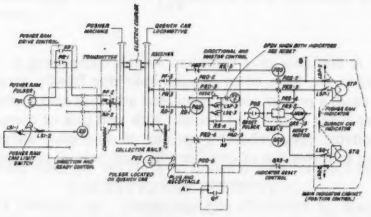


1. A coke oven door wherein the improvement comprises:
a. a door frame having a diaphragm plate and an edge member carrying a sealing strip that cooperates with a surface of a door jamb and forms a seal therewith when said door is in place;
b. a latching rack engaging said edge member and movably mounted to said door frame;
c. latching dogs resiliently mounted to said door jamb; and
d. means for linearly moving said latching rack into cooperative engagement with said latching dogs and thereby urging said sealing strip into sealing engagement with said surface of said door jamb.

3,897,311
PUSHER RAM AND QUENCH CAR TRAVEL SYNCHRONIZATION SYSTEM

Vincent G. Krenke, Pittsburgh, Pa., assignor to Koppers Company Inc., Pittsburgh, Pa.

Filed July 20, 1973, Ser. No. 381,363
Int. Cl.² C10B *35/00, 47/00*
U.S. Cl. 202—262 **6 Claims**



1. A system for synchronizing the travel of a pusher ram in a coke oven chamber with the travel of a coke quenching car receiving hot coke from the oven chamber and propelled by a locomotive relative to such oven chamber, wherein the improvement comprises:
a. switch means activated by said pusher ram as it moves toward and into an oven chamber to be pushed and closing an electrical circuit;
b. a pulse transmitter in said circuit which is activated when said switch means closes that emits pulses;
c. electrical receiver means in said locomotive that receives said emitted pulses and thereafter energizes an electrical circuit wherein there is
d. a first stepping motor that actuates said pusher ram in a step-by-step manner responsive to the received pulses and circuit energization;
e. a pulser in said quenching car that is energized by a signal emitted by said receiver;
f. a second stepping motor that is energized by said pulser and that moves said quenching car in a step-by-step manner in sequence with said pusher ram; and
g. indicator means in said locomotive that is responsive to the actuation of said stepping motors and indicates the relative positions of the pushing ram and the quenching car.

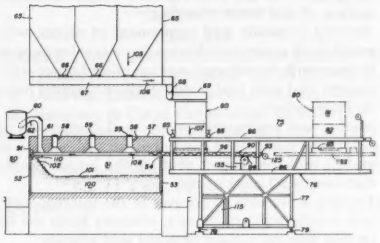
3,897,312
COKE OVEN CHARGING SYSTEM

Frank K. Armour, Flossmoor, and Robert E. Touzalin, Crete, both of Ill., assignors to Interlake, Inc., Chicago, Ill.

Filed Jan. 17, 1974, Ser. No. 434,234
Int. Cl. C10b *35/00*
U.S. Cl. 202—262 **3 Claims**

1. A system for charging a coke oven with coal through an opening in the pusher-side of the coke oven, said system comprising a coal charger having a delivery end movable into and out of the coke oven through the coke oven pusher-side opening, a first motor for moving said coal charger delivery end through the pusher-side opening into the coke oven between the pusher-side thereof and the coke side thereof, a

second motor for transporting coal through said coal charger from a source thereof to said delivery end, a detector on said delivery end movable into and out of the coke oven with said coal charger for continually sensing the presence of coal at a predetermined level in the coke oven, and control mechanism responsive to said detector for controlling said first motor and said second motor to coordinate the rate of delivery of coal delivered from said delivery end and the movement of said coal charger in the coke oven, whereby coal is charged to the coke oven during movement of said charger delivery end from



the pusher-side of the coke oven to the coke side thereof where said delivery end remains until said detector senses coal at the predetermined level, said control mechanism responsive to sensing by said detector of coal at the predetermined level coordinating the rate of delivery of coal from said delivery end and the movement of said coal charger in the coke oven toward the pusher-side thereof to deliver to the coke oven a charge of coal having a substantially uniform and predetermined level obviating the need for leveling mechanism and reducing the quantity of effluents escaping during charging of the coke oven.

3,897,313

DUCT CONNECTING DEVICE

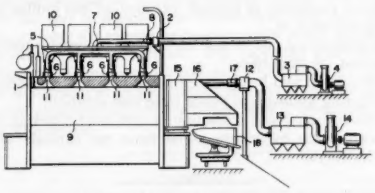
Tetsuo Ibaragi; Keishi Yamamoto, and Yasuhiko Noda, all of Wakayama, Japan, assignors to Sumikin Coke Company Limited, Wakayama, Japan

Filed Feb. 12, 1973, Ser. No. 331,446

Claims priority, application Japan, Nov. 6, 1972, 47-127780[U]; Nov. 8, 1972, 47-128650[U]; Feb. 10, 1972, 47-16885[U]

Int. Cl. C10b *31/06*

U.S. Cl. 202—263 **2 Claims**



1. A coke oven system comprising

a. an elongated coke oven battery comprising a plurality of oven chambers each having at least one coal-charging port, a charging car adapted to travel along a path parallel to said coke oven battery and to be stopped at any one of said coal-charging ports and deliver coal to one of said oven chambers,

b. a dust-collecting hood mounted on said charging car for collecting dust laden gas passing through a charging port from an oven chamber while being charged with coal,

c. a stationary duct arranged parallel with said coke oven battery, said stationary duct having a substantially horizontally disposed upper wall and communicating with a dust-removal means,

d. a plurality of connecting ports extending along said upper wall of said stationary duct, each said port corresponding to a coal-charging port in said coke oven battery and including a seal and a lid mounted on said seat, said lid comprising a magnetic material,

e. a connecting duct extending from said collecting hood above said upper wall of said stationary duct, said connecting duct being arranged to travel with said charging car and said dust-collecting hood and along the length of said upper wall of said stationary duct,

f. a downwardly facing opening in said connecting duct arranged to communicate with one of said connecting ports when said charging car is stopped at one of said coal-charging ports, and

g. electromagnet means mounted within said connecting duct and arranged, when said connecting duct opening is in communication with one of said connecting ports, to engage the lid mounted on the seat at said one connecting port, raise said lid through said downwardly facing opening in said connecting port to a position in said connecting duct permitting passage of dust laden gases from said connecting duct, through said opening and connecting port into said stationary duct, and return said lid to said seat before said charging car moves to another coal-charging port.

3,897,314

PROCESS FOR REMOVING DISTILLATION RESIDUE FROM CRUDE ISOCYANATES

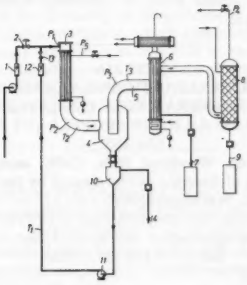
Dietrich Liebsch, Leverkusen; Dieter Becher, Leichlingen; Rudolf Kress, Cologne, and Heinz Sauer, Odenthal-Hahnenberg, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation of Ser. No. 161,817, July 12, 1971, abandoned. This application Feb. 7, 1974, Ser. No. 440,425

Claims priority, application Germany, July 18, 1970, 2035731

Int. Cl. B01d *3/00*

U.S. Cl. 203—89 **2 Claims**



1. A process for the single stage continuous separation of residue from isocyanate concentrates obtained by reacting aliphatic, cycloaliphatic, aromatic and mixed aliphatic-aromatic amines with phosgene comprising evaporating the volatile isocyanate from the concentrate in a downpipe evaporator, the pressure at outflow from said downpipe evaporator being between 0.05 to 50 mmHg, the temperature at the exit of the downpipe evaporator being between 80° to 250°C, releasing the mixture of liquid and vapor to a separator in which the same temperature and pressure conditions are maintained, separating the liquid residue from the vapor and continuously returning a portion of the liquid residue to the inlet of the downpipe evaporator while discharging the remainder of the liquid residue from the system, the quantity of the liquid residue which is returned corresponding to about 2

to about 100 times the quantity of isocyanate concentrate feed.

3,897,315

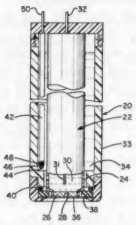
METHOD OF DETERMINING HYDROGEN SULFIDE

John H. Riseman, Cambridge; Martin S. Frant, Newton, and John A. Krueger, Cambridge, all of Mass., assignors to Orion Research Incorporated, Cambridge, Mass.

Division of Ser. No. 349,231, April 9, 1973. This application July 10, 1974, Ser. No. 487,187

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—1 T **4 Claims**



1. Method of determining the hydrogen sulfide content of a sample solution comprising the steps of:

1. diffusing the hydrogen sulfide through a membrane into a pH buffered electrolyte containing a fixed concentration of reference ions until the partial pressures of the hydrogen sulfide on both sides of the membrane are in equilibrium, said membrane being permeable to hydrogen sulfide but substantially impermeable to liquids and ionic constituents and

2. measuring the potential developed between an ion sensitive electrode having a substantially Nernstian response to the activity of sulfide ions and an ion sensitive electrode having a substantially Nernstian response to the reference ions but not responsive to sulfide ions, said electrodes being in operating contact with the electrolyte.

3,897,316

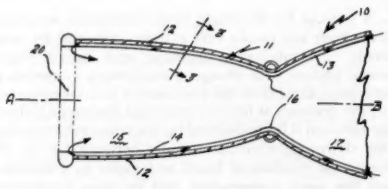
METHOD FOR MANUFACTURING A COMPOSITE WALL FOR A REGENERATIVELY COOLED THRUST CHAMBER OF A LIQUID PROPELLANT ROCKET ENGINE

David H. Huang, Woodland Hills, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 254,139, May 17, 1972, Pat. No. 3,780,533. This application Oct. 5, 1973, Ser. No. 404,090

Int. Cl. C23b *7/02, 7/00*

U.S. Cl. 204—9 **1 Claim**



1. The method of manufacturing a composite wall for a regeneratively cooled thrust chamber of a liquid propellant rocket engine, with said composite wall having therein liquid propellant cooling passages of the channel type, and with said composite wall having an external surface and an internal surface, and with said thrust chamber having an external structural shell surface defined by said external surface of said composite wall, and with said thrust chamber having an internal combustion gas side surface defined by said internal surface of said composite wall, comprising the steps of:

a. forming an outer wall component of high strength lightweight alloy, with said outerwall component having an external surface and an internal surface, and with said external surface functioning as the external surface of the composite well and defining the external structural shell surface of said thrust chamber;

b. forming a middle wall component of nickel, with said middle wall component having an external surface shaped to mate with the internal surface of said outer wall component, and with said middle wall component having an internal surface;

c. mating and joining said middle wall component to said outer wall component, with the external surface of said middle wall component abutting the internal surface of said outer wall component;

d. forming a plurality of grooves in the internal surface of said middle wall component, whereby lands are formed on said internal surface between said grooves;

e. forming a replaceable inner wall component from a preformed sheet of material of high thermal conductivity and high temperature strength and ductility with said inner wall component having an external surface shaped to mate with the internal surface which said middle wall component had prior to the formation of grooves therein, and with said inner wall component having an internal surface which functions as the internal surface of the composite wall and which defines the internal combustion gas side surface of said thrust chamber;

f. and, mating and joining said inner wall component to said middle wall component, with the external surface of said inner wall component abutting the lands formed on the internal surface of said middle wall component, whereby liquid propellant coolant passages of the channel type are formed.

3,897,317

PROCESS FOR MAKING HYPERPURE GALLIUM

Mohendra S. Bawa, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 24, 1974, Ser. No. 482,032

Int. Cl. C22b *9/00, 41/00, 61/06*

U.S. Cl. 204—59 M **3 Claims**

1. A method for preparing hyperpure metal selected from the group consisting of gallium, germanium and indium comprising the steps of:

a. halogenating one of said metals which contains less than about 2% impurities;

b. dissolving said halogenated metal in liquid ammonia;

c. filtering undissolved solids from said solution;

d. electrolyzing said resolution of said solid material; and

e. recovering hyperpure metal from the cathode of the electrolytic cell.

3,897,318

SINGLE-COMPARTMENT ELECTROLYTIC HYDRODIMERIZATION PROCESS

William A. Heckle, and Donald L. Sadler, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 385,766, Aug. 6, 1973, abandoned, and a continuation-in-part of Ser. No. 284,372, Aug. 28, 1972, abandoned. This application Aug. 15, 1974, Ser. No. 497,800

Int. Cl.[2] C25B *3/10, 11/04;* **C07C** *120/00, 103/14*

U.S. Cl. 204—73 R **27 Claims**

1. A process for hydrodimerizing an olefinic compound having the formula $R_2C{=}CR\text{-}X$ wherein -X is -CN, $-CONR_2$ or

-COOR′, R is hydrogen or R′, R′ is C_1-C_4 alkyl and at least one R directly attached to either of the two carbon atoms joined by the double bond in said formula is hydrogen which comprises electrolyzing an aqueous solution having dissolved therein at least about 0.1 percent by weight of said olefinic compound, quaternary ammonium ions in a concentration between about 10^{-5} and about 0.5 gram mol per liter and at least about 0.1% by weight of alkali metal phosphate, borate or carbonate in an undivided cell having an anode consisting essentially of carbon steel containing between about 0.02 percent about 2 percent by weight of carbon, said solution having a pH of at least about 5.

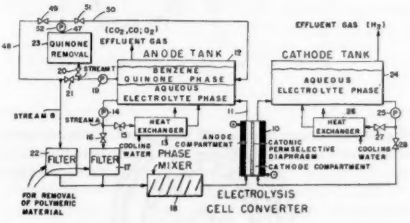
3,897,319
RECOVERY AND RECYCLE PROCESS FOR ANODIC OXIDATION OF BENZENE TO QUINONE

Fred J. Anderson, LaSalle, and Jack L. Kessler, Ottawa, both of Ill., assignors to Carus Corporation, LaSalle, Ill.

Continuation-in-part of Ser. Nos. 139,651, May 3, 1971, Pat. No. 3,758,392, and Ser. No. 203,804, Dec. 1, 1971, Pat. No. 3,758,391. This application Aug. 6, 1973, Ser. No. 385,987

Int. Cl. C07b *29/06;* **C07c** *49/64*

U.S. Cl. 204—78 **7 Claims**



1. A separation and recycle process for use with electrolysis apparatus converting benzene to quinone in anode compartments thereof, said apparatus continuously producing a dilute solution of quinone in benzene containing substantially in excess of 1 gram quinone per liter, comprising intermixing and contacting portions of said product solution with a water solution of hydroquinone containing at least 15 grams per liter of hydroquinone, said contacting being carried out with said solutions at temperatures of from 10 to 25° C., said contacting removing dissolved quinone from said product solution by reaction with said hydroquinone to form quinhydrone precipitate, said contacting being continued with formation of said quinhydrone until the resulting benzene contains less than one gram per liter of dissolved quinone, separating said resulting benzene from the remaining hydroquinone water solution and said quinhydrone precipitate, and recycling said separated benzene to said electrolysis apparatus, whereby recycled benzene is supplied to said apparatus of sufficiently low quinone content to maintain a more efficient anodic oxidation of benzene to quinone.

3,897,320
ELECTROLYTIC MANUFACTURE OF CHLORATES, USING A PLURALITY OF ELECTROLYTIC CELLS

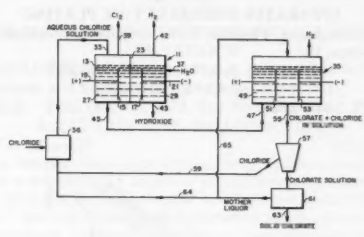
Edward H. Cook, Jr., Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Nov. 1, 1973, Ser. No. 411,622

Int. Cl. C01b *11/26;* **C01d** *1/06;* **B01k** *3/00*

U.S. Cl. 204—95 **6 Claims**

1. A method for electrolytically producing chlorate solution, chlorine, hydrogen, and hydroxide solution which comprises electrolyzing 200 to 360 g./l. of aqueous chloride solution having a pH of about 2 to 7 in an electrolytic chlorine cell, said cell having an anode compartment and a cathode compartment, an anode, a cathode, a cation-active permselective membrane of a hydrolyzed copolymer of a perfluorinated hydrocarbon and a fluorosulfonated perfluorovinyl ether, or of a sulfostyrenated perfluorinated ethylene-propylene polymer, defining a boundary between the anode and the cathode compartments and between the anode and cathode, to produce high-purity hydroxide solution and hydrogen in the cath-



ode compartment and to simultaneously produce chlorate solution and chlorine in the anode compartment, removing high-purity hydroxide solution and anolyte liquor containing chlorate and chloride from the chlorine cell and further electrolyzing the anolyte liquor in a chlorate cell to convert chloride therein to chlorate, while maintaining the temperatures of electrolysis in both cells at less than 105°C.

3,897,321
PROCESS FOR PREPARING M-CHLOROBENZENE SULPHONYL CHLORIDE AND M-DICHLOROBENZENE

Heinz-Ulrich Blank, Odenthal-Globusch; Karlfried Wedeleyer, Cologne, both of Germany, and Josef Ebersberger, deceased, late of Bergen, Obb., Germany (by Thea Ebersberger, heiress), assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 30, 1974, Ser. No. 465,649

Claims priority, application Germany, May 24, 1973, 2326414

Int. Cl. B01j *1/10;* **C07b** *9/00;* **C07c** *143/70*

U.S. Cl. 204—158 HA **7 Claims**

1. Process for preparing m-chlorobenzene sulphonyl chloride and m-dichlorobenzene which comprises reacting benzene sulphonyl chloride with chlorine in the presence of a Friedel-Crafts catalyst at a temperature of from 20° to 180°C, and after removing said catalyst, reacting the resulting m-chlorobenzene sulphonyl chloride, to form m-dichlorobenzene.

3,897,322
RADIATION POLYMERIZATION OF OLEFINIC MONOMERS IN THE PRESENCE OF METAL CONTAINING CATALYSTS

Miroslav Marek; Ludek Toman, and Jan Pecka, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed July 26, 1972, Ser. No. 275,157

Claims priority, application Czechoslovakia, July 29, 1971, 5555-71

Int. Cl. C08d *1/00;* **C08f** *1/16*

U.S. Cl. 204—159.24 **4 Claims**

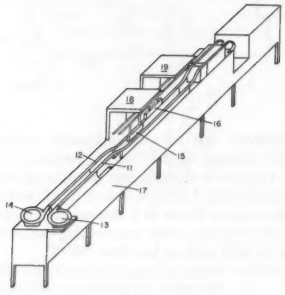
1. A method for the polymerization of isobutylene, which comprises subjecting to a source of light selected from the group consisting of ultraviolet light, visible light, and infrared light at a temperature between about 0°C. and about −140°C. an isobutylene feed selected from the group consisting of (a) essentially isobutylene and (b) essentially a mixture of isobutylene and butadiene in the presence of at least one halide catalyst selected from the group consisting of tetravalent vanadium, titanium and zirconium halides and in the presence of at least one activator for said halide catalyst selected from

the group consisting of (i) an oxide, a hydroxide, an alkoxide, and an aryloxide of a metal selected from the group consisting of (ii) the alkali metals and the alkaline earth metals, the molar ratio of said halide catalyst to said activator ranging from 10^3 to 10^{-3} part of halide catalyst to 1 part of activator.

3,897,323
APPARATUS FOR SELECTIVE PLATING

Roy Schlotthauer, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Aug. 5, 1974, Ser. No. 495,005
Int. Cl.[2] C25D *5/02*
U.S. Cl. 204—224 R **3 Claims**

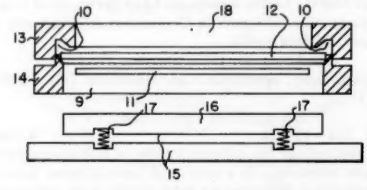


1. Apparatus for selective plating of articles having conductive portions to be plated and conductive portions extending therefrom not to be plated comprising a conveyor belt having apertures; means for feeding the articles into the apertures with the portions not to be plated extending therethrough, thereby masking those portions of the article from contact by the plating solution; means for moving the conveyor belt so that conductive liquid means establish an electrical connection to those portions of the article extending through the belt; and, plating header means for contacting the unmasked portions of the article with plating solution for a sufficient length of time to plate those portions.

3,897,324
MATERIAL DEPOSITION MASKING FOR MICROCIRCUIT STRUCTURES

Louis A. Del Monte, Minnetonka, and Robert H. Grangroth, Buffalo, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed June 25, 1973, Ser. No. 373,526
Int. Cl. C23c *15/00;* **B05c** *11/16*
U.S. Cl. 204—298 **6 Claims**



1. An apparatus for flexing a mask provided as a sheet of a mask material having said mask forced against a microcircuit structure with said apparatus to be used in depositing materials on said structure to form deposited material formations thereon, said apparatus comprising:

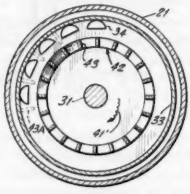
a holder for holding said mask in a manner such that said mask is forced toward having a protrudent shape by said holder as held, and

means for forcing major surface of said mask as held and said structure against one another with a selected amount of force, said major surface of said mask being one which is forced toward being convex with said mask being held as said.

3,897,325
LOW TEMPERATURE SPUTTERING DEVICE

Shoichi Aoshima, and Tatsuo Asamaki, both of Tokyo, Japan, assignors to Nippon Electric Varian, Ltd., Tokyo, Japan

Filed Oct. 23, 1973, Ser. No. 408,822
Claims priority, application Japan, Oct. 20, 1972, 47-104402; Dec. 25, 1972, 47-200; Feb. 26, 1973, 48-22921; Apr. 6, 1973, 48-38767
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 **15 Claims**

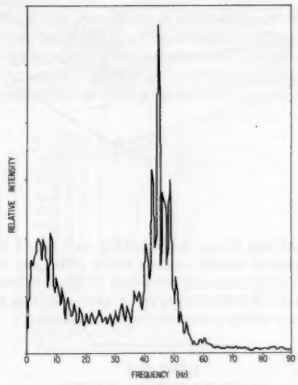


1. A device for sputtering the material of a cathode means onto an object, said device including a chamber, means for supplying a sputtering gas to said chamber, first means disposed in said chamber a spaced distance from said cathode means for holding said object and second means for providing electric fields between said first means and said cathode means to produce a gas discharge in said chamber, wherein the improvement comprises third means disposed in said chamber adjacent to said first means and fourth means for varying the paths of electrons produced during the sputtering and initially accelerated by said electric fields towards said first means, said third means comprising a plurality of thin metal plates located substantially between said cathode means and said first means for receiving a major proportion of the electrons having the paths varied by said fourth means, each of said metal plates having a width substantially in the direction of the electric field at the location of each metal plate and extending in the direction of the electric field to collect electrons deviating from their initial path of movement towards said first means.

3,897,326
PROTEIN COATED ELECTRODE

Egidijus E. Uzgiris, Schenectady, N.Y., assignor to The United States of America as represented by the Secretary of Health, Education, and Welfare, Washington, D.C.

Filed Aug. 16, 1974, Ser. No. 498,281
Int. Cl. B01k *5/00*
U.S. Cl. 204—299 **6 Claims**



1. An electrode for use in measuring electrokinetic phenomena, said eletrode comprising platinized platinum coated with bovine serum albumin.

3,897,327
HYDROCRACKING PROCESS WITH STABILIZED Y-ZEOLITE CATALYSTS

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. Nos. 191,123, Oct. 20, 1971, abandoned, and Ser. No. 236,185, March 20, 1972, Pat. No. 3,781,199. This application Oct. 15, 1973, Ser. No. 406,683The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.
Int. Cl. C10g *13/02*
U.S. Cl. 208—111 **16 Claims**

1. A process for the hydrocracking of a hydrocarbon feedstock to produce a lower boiling hydrocarbon product, which comprises subjecting said feedstock plus added hydrogen to hydrocracking conditions of pressure and temperature in contact with a catalyst comprising a Group VIB and/or Group VIII metal, metal oxide or metal sulfide hydrogenating component intimately dispersed in a stabilized metal-cation-deficient Y zeolite cracking base, said cracking base having been prepared by the steps of:

1. calcining an ammonium-sodium Y zeolite containing about 0.6 – 5 weight-percent of sodium as Na_2O, said calcining being carried out at a temperature between about 600°and 1650°F in contact with at least about 0.2 psi of water vapor for a sufficient time to substantially reduce the unit cell size of said zeolite and bring it to a value between about 24.40 and 24.64 A;
2. subjecting the calcined zeolite to further ammonium ion exchange under conditions adjusted to replace at least about 25 percent of its residual zeolitic sodium ions with ammonium ions and produce a final product containing less than about 1 weight-percent Na_2O;
3. consolidating the product from step (2) into granules having intimately admixed therein a finely divided hydrous oxide selected from the class consisting of alumina, silica, magnesia, titania, zirconia, thoria, beryllia, chromia, clays and mixtures thereof; and
4. calcining the granules at a temperature between about 600° and 1500°F for a time sufficient to effect substantial deammoniation, but insufficient to reduce the unit cell size of the zeolite to below about 24.40 A.

3,897,328
IRIDIUM-CONTAINING REFORMING CATALYST AND USE THEREOF

Howard Lee Mitchell, III, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Oct. 29, 1973, Ser. No. 410,710
Int. Cl. C10g *35/08;* **B01j** *11/78, 11/12*
U.S. Cl. 208—139 **33 Claims**

1. A catalyst suitable for conversion of hydrocarbons comprising a composite of an acidic porous inorganic oxide support, platinum in concentration ranging from about 0.05 to about 3 percent, iridium in concentration ranging from about 0.05 to about 3 percent, palladium in concentration ranging from about 0.0001 to about 2.5 percent, and halogen in concentration ranging from about 0.1 to about 2.5 percent based on the total weight of the catalyst, the atom ratio of the platinum:iridium ranging from about 0.25:1 to about 5:1, and the atom ratio of iridium:palladium ranging from about 1:1 to about 40:1.

3,897,329
SPLIT FLOW HYDRODESULFURIZATION OF PETROLEUM FRACTION

William F. Franz, Gardiner, and Howard V. Hess, Glenham, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,875
Int. Cl. C10g *23/00*
U.S. Cl. 208—210 **10 Claims**

1. A process for the conversion of a residue-containing petroleum fraction into lighter products of reduced sulfur content in which the hydrogen consumption is between 100 and 300 scfb which comprises introducing said petroleum fraction through a point of entry into a desulfurization reactor comprising a first hydrodesulfurization catalyst zone below and a second hydrodesulfurization catalyst zone above said point of entry to flow downwardly through said first catalyst zone in countercurrent flow relationship to hydrogen passing upwardly through said first catalytic zone, passing said hydrogen upwardly with volatile hydrocarbons and entrained liquids into and through said second catalyst zone and recovering said products of reduced sulfur content from the reaction effluent of said first and second catalyst zones, the temperature in said first catalyst zone being maintained between 550° and 850°F. and the temperature in said second catalyst zone being maintained between 875° and 1000°F.

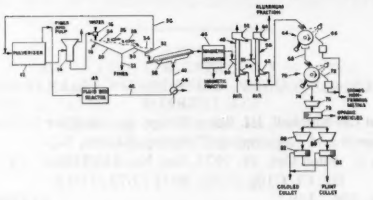
3,897,330
REFUSE SORTING WITH SEPARATION OF GLASS AND METALS

Hugh R. Rhys, Grand Rapids, Mich., assignor to Sortex Company of North America, Inc., Lowell, Mich.

Filed May 24, 1973, Ser. No. 363,578
Int. Cl. B07c *5/34*
U.S. Cl. 209—75 **13 Claims**

1. In a method of sorting refuse into its components wherein said refuse is comminuted into a particulate mass, and a glass concentrate fraction consisting substantially of glass particles and a minor portion of residual non-glass particles, including metal particles, are sorted from a substantially non-glass fraction and said glass concentrate fraction is photoelectrically sorted according to color, the improvement which comprises: passing said glass concentrate fraction through a high-tension electrostatic sorting zone prior to said photoelectric sorting

step, and in said electrostatic sorting zone, electrostatically sorting said particles according to the electrical conductivities



thereof, and

recovering the less conductive glass fraction.

3,897,331

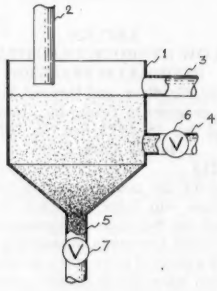
MERCURY RECOVERY

Bruce T. Smith, and Roger S. Pacheco, both of Brunswick, Ga., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,691

Int. Cl. B03b *3/00*

U.S. Cl. 209—10 **8 Claims**



1. In the method for recovering mercury from carbonaceous filter aid used in filtration of mercury cell alkali metal hydroxide solution to remove mercury therefrom, the steps which comprise:

a. slurrying the filter aid in a liquid medium;

b. allowing the slurried filter aid to settle to form a mercury-rich filter aid slurry stratum and a supernatant mercury-lean filter aid slurry stratum; and

c. separately recovering the mercury-rich stratum.

3,897,332

GRAIN SEPARATING APPARATUS

Gilbert Delfosse, Mere, and Jose Andiano, Vanves, both of France, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

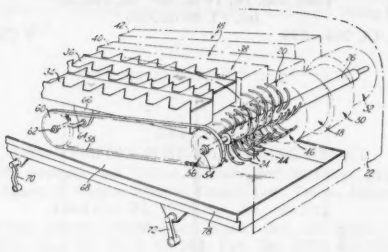
Filed Mar. 25, 1974, Ser. No. 454,623

Claims priority, application United Kingdom, Mar. 24, 1973, 14306/73

Int. Cl.[2] B03B *7/00;* **B07B** *1/28, 1/34;* **A01F** *12/32*

U.S. Cl. 209—12 **11 Claims**

1. A grain separating apparatus including at least one oscillating sieve for separating grain from other crop material and for conveying the other crop material; a rotor rotatably mounted, for rotation about a substantially horizontal axis, in the grain separating apparatus adjacent to the oscillating sieve; at least one group of fingers attached to the rotor for conveying crop material to the rear; a plurality of sets of fingers in said one group of fingers with one or more fingers in each set of fingers and with the maximum radial distance from the axis of rotation of the rotor to a portion of a finger varying from one of the sets of fingers to another set of fingers; drive means to drive the rotor in timed relation to the oscillating sieve; attaching means for attaching each set of fingers to the rotor angularly spaced relative to the other sets of fingers to maintain a predetermined minimum distance between each set of fingers and the oscillating sieve; and collecting means to catch the grain which passes through the fingers.



3,897,333

FLOCCULATING AGENTS

John R. Field, Halifax, and Graham Smalley, Huddersfield, both of England, assignors to Allied Colloids Manufacturing Co., Ltd., Yorkshire, England

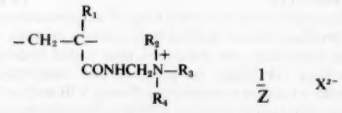
Continuation of Ser. No. 224,282, Feb. 7, 1972, abandoned. This application Mar. 28, 1974, Ser. No. 455,700

Claims priority, application United Kingdom, Feb. 24, 1971, 5347/71

Int. Cl. C02c *3/00;* **C02b** *1/20*

U.S. Cl. 210—10 **4 Claims**

1. A method in which an organic suspension selected from raw sewage sludges and sludges obtained by biological degradation is flocculated by adding to the suspension an aqueous solution of a polymer having an intrinsic viscosity of at least 0.5 when measured in 3 Molar sodium chloride and composed of recurring units of which substantially 60% or more have the formula:



where R_1 is hydrogen, R_2, R_3 and R_4 are methyl, X is an anion selected from the group consisting of methyl sulfate and chloride and z is an integer, and wherein the remainder of the polymer is a nonquaternized acrylamide.

3,897,334

SINGLE BASIN AERATED SEWAGE LAGOON WITH SPRING TIME INTENSIFIED AERATION

Declan S. Murphy, Montreal, Canada, assignor to Atara Corporation, Montreal, Canada

Division of Ser. No. 64,508, Aug. 17, 1970, abandoned. This application Mar. 14, 1972, Ser. No. 234,618

Int. Cl. C02c *1/02*

U.S. Cl. 210—15 **2 Claims**

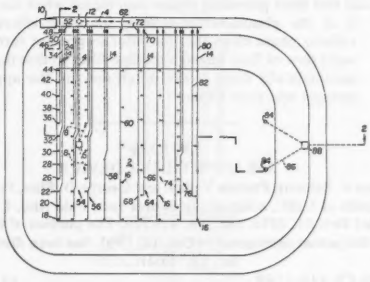
1. A method of sewage treatment comprising:

introducing raw sewage from an inlet at one end of a lagoon, passing said sewage through the lagoon in a flow path and removing the treated effluent at an outlet at the opposite end of said lagoon;

treating said sewage in a first zone of high intensity aeration provided by a first densely disposed multiple of aerators located in rows across the flow path in said lagoon adjacent the inlet;

further treating said sewage in a second zone of high intensity aeration provided by a second multiple of aerators located in rows across the flow path between said first multiple and said outlet, said second multiple of aerators being less densely disposed than said first multiple of aerators;

subjecting said sewage to a third zone of high intensity aeration provided by a third multiple of aerators located in rows across the flow path between said second multiple of aerators and said outlet, said third multiple being more densely disposed than said second multiple of aerators;



passing the treated sewage through a further zone between said third multiple of aerators and said outlet, said further zone being devoid of aerators;

supplying air to said aerators by conduits connected to each row of aerators; and

maintaining a normally gradually decreasing aeration intensity in the sewage being treated downstream from the first multiple of aerators by maintaining the air supply to said first and second multiples of aerators and controlling the air supply to said third multiple of aerators, said third multiple of aerators being capable of providing a zone of final high intensity aeration in the sewage being treated, said third multiple of aerators including a temperature control switch connected to means which close the conduits to said third multiple of aerators when the temperature in said lagoon falls below about 10°C and which open said conduits when the temperature in said lagoon rises above about 10°C.

3,897,335

LIQUID COOLANT TREATING PROCESS AND APPARATUS

Robert H. Brandt, Bowling Green, Ohio, assignor to Henry Manufacturing Co., Inc., Bowling Green, Ohio

Filed Mar. 6, 1973, Ser. No. 338,527
Int. Cl. B01d *17/04*
U.S. Cl. 210—71 **2 Claims**

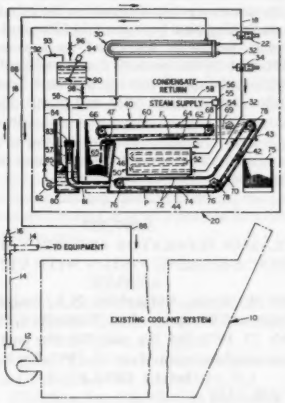
1. In a process for use in a machine tool coolant system containing a circulating body of aqueous coolant emulsion containing as impurities bacteria, particulate solid contaminants and tramp oil, said tramp oil being present as a separate liquid phase entrapped in said emulsion and wetting said solid contaminants; the steps of:

A. continuously withdrawing from about 0.01% to 1% per minute of the volume of said circulating emulsion,

B. continuously preheating the withdrawn emulsion in a heat exchange means,

C. heating said withdrawn emulsion to a temperature of from about 160° to about 200°F. while retaining at said temperature and substantially quiescent in a pool in a tank for a period of time on the order of from about 30 to about 90 minutes to, substantially simultaneously, (1) kill the bacteria in said portion, (2) release entrapped tramp oil from said emulsion, and (3) release some of said solid contaminants from the emulsion of said oil,

D. skimming the released tramp oil from the surface of said pool and removing it from said tank,



E. settling and removing the released solid contaminants from said pool and said tank, and finally

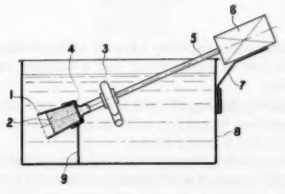
F. continuously returning the withdrawn coolant from said tank to the circulating body of emulsion through said heat exchange means thereby performing the preheating step B.

3,897,336

METHOD OF REGENERATION OF SOLDER, PARTICULARLY OF TIN-LEAD SOLDERS, AND AN APPARATUS FOR APPLICATION THE METHOD

Andrzej Bydalek, Wroclaw; Ferdynand Romankiewicz, Szewce; Jan Romer, and Edmund Tomasik, both of Wroclaw, all of Poland, assignors to Politechnika Wroclawska

Filed Jan. 11, 1974, Ser. No. 432,486
Claims priority, application Poland, Jan. 11, 1973, 160232
Int. Cl. B01d *35/18*
U.S. Cl. 210—71 **13 Claims**



1. A method for the regeneration of solder contained in a tank, said method comprising dividing the tank into two chambers by means of a partition extending upwardly in the tank to a level beneath the level of solder contained in the tank whereby the chambers are in communication with one another above the partition, immersing a filter in one chamber in the tank, connecting a pump to the filter with the outlet of the pump disposed in the other chamber such that circulation of the solder is produced in the tank through the filter and pump, and positioning the filter and pump near the surface of the solder and proximate the upper edge of the partition such that a free counter circulation is produced in the solder above

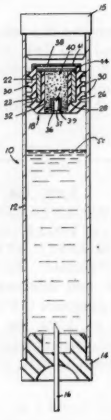
the partition which is opposite the direction of circulation of the solder through the filter and pump.

8. Apparatus for the regeneration of solder contained in a tank, said apparatus comprising a partition extending upwardly in said tank over a portion of the height thereof to divide the tank into two chambers which intercommunicate with one another above the partition, a filter disposed in one of said chambers, a pump disposed in the other of said chambers, a connecting pipe between said filter and pump forming an assembly therewith supported on said partition, drive means for said pump supported externally of said tank for producing circulation of solder in said tank from one chamber to the other through said filter and pump, the solder being contained in said tank to a level above the filter and pump to produce a free counter circulation in the solder above the partition in a direction opposite the direction of circulation of the solder through the filter and pump.

3,897,337
PLÅSMA SEPARATOR ASSEMBLY HAVING INTERFACE-SEEKING PISTON WITH CENTRIFUGAL VALVE

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,370. The portion of the term of this patent subsequent to July 15, 1992, has been disclaimed.
Int. Cl. B01d *21/26*
U.S. Cl. 210—136 **6 Claims**



1. A separator assembly capable of separating blood into a plasma/serum or light phase and a cellular or heavy phase comprising:

a container having at least one open end which is adapted to receive blood for subsequent separation into a light phase and a heavy phase;

a closure sealing the open end of the container, the closure being formed of a self-sealing, elastomeric material which is penetrable by a cannula through which blood to be separated is conducted into the container;

an interface-seeking piston having a specific gravity relatively greater than blood and slidably mounted in the container adjacent one end thereof and being movable downwardly in said container due to the influence of centrifugal force and having means on an outer surface for providing sealing engagement with an inner surface of the container;

a valve assembly mounted on the piston and disposed at the lower end thereof, said assembly comprises a lower resilient diaphragm mounted on the lower end of said piston and having apertures formed therein, said apertures being normally closed and adapted to open during the downward movement of the piston; an upper resilient diaphragm mounted on the upper end of said piston, having apertures formed therein, said apertures being normally closed and adapted to open during the downward movement of the piston;

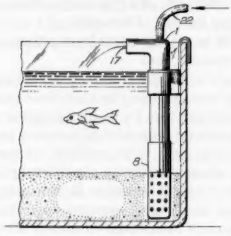
a filter assembly mounted between said valve assembly and said upper diaphragm and being in fluid communication with the valve assembly, said filter assembly including a lower coarse filter having an average pore opening larger than the diameter of blood cells, disposed adjacent said valve assembly and an upper fine filter having an average pore opening smaller than the diameter of blood cells, said fine filter disposed between the upper diaphragm and said coarse filter, said filter assembly being capable of removing substantially all solid material from the separated plasma/serum phase; and

said fine filter providing piston stop means when said piston is at the plasma/serum-cellular interface whereby the cellular phase clogs the fine filter to prevent further upward flow of fluid through the fine filter so that the piston automatically stops at said interface and the upper diaphragm apertures close.

3,897,338
AIR CANE FILTER DEVICE

John P. Bennett, Portola Valley, and George D. Bliss, Palo Alto, both of Calif., assignors to Syntex Inc., Palo Alto, Calif.

Filed Dec. 11, 1973, Ser. No. 423,720. The portion of the term of this patent subsequent to Oct. 15, 1991, has been disclaimed.
Int. Cl.[2] E04H *3/20*
U.S. Cl. 210—169 **11 Claims**



1. A filtration and aeration device adapted to be positioned to an aquarium containing a body of liquid and a gravel bed, comprising in combination:

a. an elongated tubular member which is (i) closed at its lower end with a substantially planar wall substantially perpendicular to said elongated tubular member and of larger diameter than said tubular member thereby providing a base supporting means for said apparatus and (ii) open at its upper end thereby defining a chamber, said lower end adapted to be inserted into or through all or a portion of said gravel bed, said elongated tubular member being provided at its lower portion with foraminous structure comprising a plurality of passages for supplying water from the aquarium into the interior of said tubular member while restricting the flow of gravel into said interior;

b. air dispersion means for supplying dispersed air to the interior of said elongated tubular member at a point slightly above the uppermost level of said passages;

c. an air inlet tube means positioned in the interior of said elongated tubular member and entering said interior at the upper end of said elongated tubular member, for supplying air to said air dispersing means, whereby liquid is drawn from the aquarium through said gravel bed and through said passages into the interior of said elongated tubular member and aerated, and air lifted, through the

interior of said elongated tubular member and discharged via said open end.

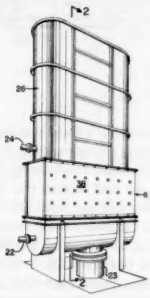
3,897,339
FILTER ASSEMBLY HAVING A PRECOMPACTED FILTER MEDIUM

Edward D. Arndt, Kentfield, Calif., assignor to Bohna Engineering & Research, Inc., San Francisco, Calif.

Continuation of Ser. No. 320,840, Jan. 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 57,982, July 24, 1970, abandoned. This application May 24, 1974, Ser. No. 472,993

Int. Cl. B01d *25/06*

U.S. Cl. 210—283 **2 Claims**



1. A filter assembly comprising; a filter housing means, a plurality of flat filter elements extending substantially across one dimension of said filter housing means, said elements comprising confinement means including porous sheet material arranged along lateral surfaces of the elements to define a closed structure of substantially uniform thickness having a maximum of approximately 0.5 inches, a particulate filter medium having a maximum effective particle size of approximatey 0.25 millimeters and a uniformity coefficient in the approximate range of 1.0 to 2.0 and being precompacted by at least approximately 10% relative to its normal bulk density, said medium being disposed within and fully occupying said confinement means and being uniformly precompacted to provide for substantial filtration at the surfaces of said confined medium, spacer means including spaced means disposed adjacent to said confinement means and in contact with contiguous portions of said porous sheet material throughout the extent thereof, said spaced means coacting with said porous sheet material to continuously and rigidly confine said filter medium in order to maintain its precompacted condition during filter and backwash operations, said spacer means further maintaining adjacent filter elements in spaced apart relation within the filter housing to provide influent and effluent passages on opposite sides of each filter element, means for supporting the filter elements and the spacer elements within said filter housing means, an influent manifold for communicating the influent passages with a fluid inlet, an outlet manifold for communicating the effluent passages with a fluid outlet, said flat filter elements and the spacer means comprising a plurality of frame members arranged in contiguous parallel relationship to form at least a portion of said housing means, selected ones of said frame members comprising said filter elements and being U-shaped supports vertically arranged and having said porous sheet material disposed over the extent of each lateral side thereof and closing the open end of the U-shaped supports, said spacer means comprising other frame members interposed between said selected frame members and also comprising U-shaped supports, said spaced means comprising rigid flat, open grids, said other frame members defining one of said influent and effluent passages and being disposed in inverted U-shaped disposition with respect to the other frame members defining the other of said influent and effluent passages, said frame members including risers extending along the vertical height of the filter elements and being spaced apart relative to each other and the legs of the U-shaped supports, the spacer means being arranged in vertically extending spaces formed by the risers and the legs of the U-shaped supports in the other frame members, each spacer means comprising flat open grids respectively abutting the two adjacent porous sheets and ribs arranged between the grids to establish appropriate spacing and permit substantially unimpeded fluid flow through the influent and effluent passages, and plates arranged on opposite sides of and parallel with the frame members, the plates, the U-shaped members and the risers forming aligned openings for receiving tie rods to secure the frame members together as a structural unit and to assist in maintaining proper compaction and confinement of the filter elements during filter operations, the plates and the frame members forming at least a portion of a housing for containing the filter unit.

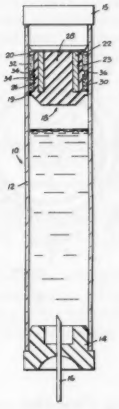
3,897,340
SERUM/PLASMA SEPARATOR ASSEMBLY WITH INTERFACE-SEEKING PISTON HAVING COARSE AND FINE BAND FILTERS

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Feb. 27, 1974, Ser. No. 446,358. The portion of the term of this patent subsequent to July 15, 1992, has been disclaimed.

Int. Cl. B01d *21/26*

U.S. Cl. 210—314 **4 Claims**



1. A separator assembly capable of separating blood into a plasma/serum or light phase and a cellular or heavy phase comprising:

a container having at least one open end which is adapted to receive blood for subsequent separation into a light phase and a heavy phase;

a closure sealing the open end of the container, the closure being formed of a self-sealing, elastomeric material which is penetrable by a cannula through which blood to be separated is conducted into the container;

an interface-seeking piston having a specific gravity greater than blood and slidably mounted in the container and having means on an outer surface for providing sealing engagement with an inner surface of the container;

said means including at least two radially extending deformable seal rings mounted on the piston and disposed at the lower and upper ends thereof and a notched radially extending ring disposed between said upper and lower seal rings;

said seal rings being capable of being deformed to open a path around said piston when said assembly is subjected to centrifugal force;

a filter assembly mounted on said piston and positioned between said upper and lower seal rings and being in slidably sealing engagement with the inner surface of the container so that separated plasma/serum is filtered when said assembly is centrifuged;

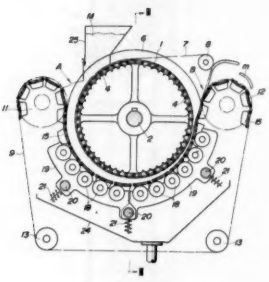
said filter assembly including a first filter element located adjacent to said upper seal ring and having an average pore size smaller than said heavy phase; and a second filter element located adjacent to said lower seal ring and having an average pore size greater than said heavy phase; and

said filter assembly providing piston stop means when said piston is at the plasma/serum-cellular interface whereby the cellular phase clogs said first filter element prevent the upward flow of plasma/serum therethrough so that the piston automatically stops at said interface.

3,897,341
FILTER

Masakatsu Ozawa, 207 Mizukami, Fujieda-shi, Shizuoka-ken, Japan

Filed Feb. 4, 1974, Ser. No. 439,242
Claims priority, application Japan, Feb. 7, 1973, 48-14759; Feb. 7, 1973, 48-14760
Int. Cl. B01d *33/02;* **B30b** *9/24*
U.S. Cl. 210—386 **4 Claims**

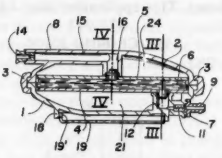


1. A filter comprising a rotatable drum having a plurality of perforations; a plurality of ropes encircling said drum for maintaining a substance being treated in position; a plurality of pressure rollers arranged on the periphery of said rotatable drum on supporting shafts to provide for pushing action toward said drum; a pressure belt having a plurality of perforations, said belt being formed in an endless belt and interposed between said drum and said pressure rollers; chains mounted on both sides of said pressure belt for driving said pressure belt; sealing means provided at both edges of said drum and at corresponding edges of said pressure belt; guide means mounted on the supporting shafts of the plurality of pressure rollers and so positioned that the clearance between said pressure belt and said drum is narrower at the side where the substance being treated is output than at a supply side thereof; rollers mounted on the chains and adapted to be guided into said guide means; and a means for supplying muddy substance to be treated positioned adjacent to the portion where the clearance between said drum and said pressure belt is widest the interior surface of the wall of said drum tapering outwardly from its central portion.

3,897,342
DEVICE FOR FILTERING AND/OR TREATING LIQUID OR GASEOUS MEDIA

Paul Schmid, and Albert Droesch, both of Riehen, Switzerland, assignors to GHH Basel AG, Basel, Switzerland

Filed Nov. 2, 1973, Ser. No. 412,412
Claims priority, application Switzerland, Feb. 21, 1973, 2467/73
Int. Cl. B01d *27/08*
U.S. Cl. 210—445 **4 Claims**



1. In a device for treating a fluid medium, which comprises two shell-shaped housing portions, one of the housing portions having an inlet for the fluid medium to be treated, the fluid medium inlet having an end within the one housing portion, another one of the housing portions having an outlet for the treated fluid, the fluid medium outlet having an end within the other housing portion, and a fluid medium treatment insert dismountably inserted between the housing portions and disposed between the inlet and outlet ends, the improvement of

1. two supporting plates for the treatment insert,
   a. each supporting plate being supported in the interior of a respective one of the housing portions and
   b. each supporting plate defining a cavity for receiving a part of the treatment insert whereby the insert is held between the supporting plates,
2. two nipples extending from the treatment insert,
   a. one nipple passing through one of the supporting plates into the inlet end and the other nipple passing through the other supporting plate into the outlet end, and
   b. the inlet and outlet ends defining limited spaces for receiving the respective treatment insert nipples, and
3. fluid-tight sealing means in the limited spaces for sealing the inlet and outlet ends.

3,897,343
PLASMA SEPARATOR-HYDROSTATIC PRESSURE TYPE

Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

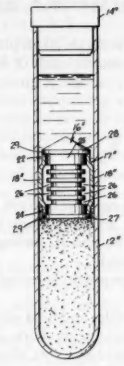
Filed Feb. 27, 1974, Ser. No. 446,383
Int. Cl. B01d *21/26*
U.S. Cl. 210—516 **5 Claims**

1. A piston adapted for use for separating the light phase of blood from the cellular or heavy phase of anti-coagulant treated blood disposed in a separator assembly including a blood collection container comprising:

a piston having an average specific gravity heavier than the light phase of blood but lighter than the heavy phase so that when the blood is separated into its component phases the piston will migrate to the light phase-heavy phase interface; said piston comprising;

a body portion which is generally cylindrical and has a diameter less than the internal diameter of the blood collection container; a substantially non-porous, flexible sleeve member mounted around said body portion and sealed around the top and bottom ends thereof, thereby forming an annular space therebetween, said space having a gas therein, said gas having a pressure greater than atmospheric pressure and selected so as to expand the flexible barrier means to form a liquid-tight seal when mounted within the container and said gas being compressible when subjected to increased hydrostatic force

so that the flexible barrier means will move away from the inner walls of the container to break the seal and permit

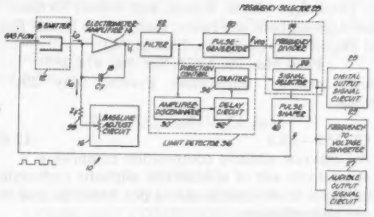


the piston to move toward the cellular-plasma interface when centrifuged.

3,897,344
FREQUENCY-PROGRAMMED ELECTRON-CAPTURE DETECTOR

J. Howard Marshall, III, Pasadena, and Timothy A. Harrington, Sierra Madre, both of Calif., assignors to MDH Industries, Inc., Pasadena, Calif.

Filed July 31, 1974, Ser. No. 493,337
Int. Cl. G01n *23/12*
U.S. Cl. 250—386 **13 Claims**



1. For use in combination with an electron-capture detector, an improved pulse-generating circuit for providing an output signal having a frequency corresponding to and representative of the concentration of an electron-capturing compound, the improved circuit comprising:

a. amplifier means coupled to the electron-capture detector for providing an output signal representative of the relative concentration of an electron-capturing compound in a sample quantity;

b. pulse-generator means coupled to the amplifier means for providing pulses of variable frequencies which frequencies vary over a range less than the range of frequencies of the output signal of said circuit, the pulse-generator means being operable in response to the amplifier means output signal;

c. limit detector means coupled to the amplifier means and the pulse-generator means, for generating a signal whenever the amplifier means output signal controlling the pulse-generator means is above or below the operating range of the pulse-generator means; and

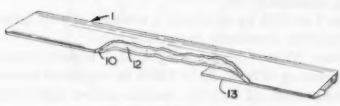
d. frequency selector means coupled to the pulse-generator means, limit detector means, and the electron-capture detector for reducing the range of pulse repetition frequencies from the pulse-generator means, the frequency selector means being operable in response to the output signal of the limit detector means,

whereby the rate of pulses applied to the electron-capture detector will maintain the amplifier means output signal within the operating range of the pulse-generator means so that a signal having a frequency proportional to and representative of the concentration of an electron-capturing compound in a sample is fed back from the pulse-generator means to the electron-capture detector.

3,897,345
HIGH STRENGTH LOW ATTENUATION COUCH TOP

Melvin Lewis Foster, Ottawa, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Sept. 18, 1973, Ser. No. 398,348
Claims priority, application Canada, July 20, 1973, 177017
Int. Cl. G03b *41/16*
U.S. Cl. 250—439 **2 Claims**



1. A diagnostic stretcher, substantially transparent to X-radiation, with an attenuation equivalent to less than 1 mm of aluminum when subject to X-rays of 90 kvp passed normal through the said stretcher, said stretcher comprising:

i. an outer skin of carbon or graphite fibres in epoxy matrix, said skin having a configuration of a long thin and substantially flat board suitable for receiving a patient thereon and for cantilevered mounting on a stand, and

ii. a rigid polyurethane foam core within said skin, said skin and core being bonded together.

3,897,346
FLAME RETARDANT AGENT FOR SYNTHETIC PLASTICS

Calvin Vogel, Easton, Pa., assignor to GAF Corporation, New York, N.Y.

Filed June 16, 1972, Ser. No. 263,527
Int. Cl. C09k *3/28*
U.S. Cl. 252—8.1 **9 Claims**

1. A fire retardant additive comprising a polybrominated C_2-C_6 aliphatic compound and an inorganic material selected from the group consisting of the borates-, phosphates-, sulphamates-, and oxides- of zinc, magnesium, calcium, barium, and aluminum.

3,897,347
WASHING AGENTS CONTAINING A TEXTILE SOFTENER AND PROCESS OF WASHING AND SOFTENING TEXTILES

Hans-Werner Eckert, Dusseldorf, and Hans-Jürgen Lehmann, Mettmann, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany

Filed Nov. 2, 1972, Ser. No. 303,274
Claims priority, application Germany, Nov. 22, 1971, 2157785
Int. Cl. D06m *11/00*
U.S. Cl. 252—8.75 **23 Claims**

1. A one-step process for the washing and softening of textiles which consists essentially of immersing soiled textiles in an aqueous softening washing liquor bath at temperatures of from 20° to 100°C for a time sufficient to clean and soften said textiles and recovering said cleaned and softened textiles, said aqueous, softening washing liquor bath containing

1. from 0.2 to 1.5 gm/liter of a tenside component consisting of from 20 to 100% by weight of said tenside component of anionic surface-active sulfonates and sulfates with

from 8 to 18 carbon atoms in the hydrophobic moiety, from 0 to 80% by weight of said tenside component of soaps and from 0 to 45% by weight of said tenside component of non-ionic surface-active compounds;

2. from 0.05 to 1.2 gm/liter of a softener component alkylenediamine of the formula

$$R - NH - R' - NH_2$$

wherein R is a member selected from the group consisting of alkyl having 8 to 24 carbon atoms, alkenyl having 8 to 24 carbon atoms, alkadienyl having 8 to 24 carbon atoms and R′ is alkylene having 2 to 6 carbon atoms, adducted with from 1 to 3 mols of a vicinal lower alkyleneoxide;

3. from 0.2 to 6.0 gm/liter of at least one conventional builder salt wherein sufficient alkaline-reacting builder salts are present whereby the pH of said washing liquor bath is 7 or over,

with the proviso that the amount of said tenside component is at least as large as the amount of said softener component alkylenediamine adduct.

14. A detergent composition containing textile softeners consisting essentially of:

A. from 5 to 80% by weight of a mixture of a surface-active component consisting essentially of:

1. from 50 to 80% by weight of a tenside component consisting of from 20 to 100% by weight of said tenside component of anionic surface-active sulfonates and sulfates with from 8 to 18 carbon atoms in the hydrophobic moiety, from 0 to 80% by weight of said tenside components of soaps, at least some of said soaps having from 20 to 26 carbon atoms, and from 0 to 45% by weight of said tenside component of non-ionic surface-active compounds;

2. from 20 to 50% by weight of a softener component alkylenediamine of the formula

$$R - NH - R' - NH_2$$

wherein R is a member selected from the group consisting of alkyl having 8 to 24 carbon atoms, alkenyl having 8 to 24 carbon atoms, alkadienyl having 8 to 24 carbon atoms and mixtures thereof, and R′ is alkylene having 2 to 6 carbon atoms, adducted with from 1 to 3 mols of a vicinal lower alkyleneoxide;

3. from 0 to 10% by weight of non-surface-active foam inhibitors; and

4. from 0 to 10% by weight of foam stabilizers;

B. from 20 to 95% by weight of at least one conventional builder salt wherein sufficient alkaline-reacting builder salts are present whereby the pH of a 1% solution of said detergent composition is 7 or over and wherein the amount of alkaline to neutral-reacting builder salts is from 0.5 to 7 times the amount of said tenside component; and

C. from 0 to 40% by weight of any one of the following customary components of detergent compositions:

a. bleaches and their stabilizers and activators,

b. soil suspension agents, (c) optical brighteners,

d. enzymes, (e) antimicrobial agents, and (f) water;

with the proviso that the amount of said alkoxylated alkylenediamine in said detergent compositions is from 2 to 20% by weight.

3,897,348

SURFACE TREATING COMPOSITIONS CONTAINING SURFACE ACTIVE AMMONIOAMIDATE COMPOUNDS

Ronald Edward Atkinson, Northumberland, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 243,089, April 11, 1972, abandoned. This application June 27, 1973, Ser. No. 374,148

Int. Cl.[2] D06M *13/40;* **C11D** *1/88*

U.S. Cl. 252—8.75 **11 Claims**

1. A surface-treating composition consisting essentially of:

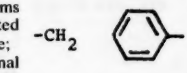
a. a substituted ammoniamidate having the formula

$$R_1CO\ N^-N^+R_2\ R_3\ R_4 \qquad (I)$$

or a cationic adduct thereof having the formula

$$[R_1\ CO\ NH\ N\ R_2R_3\ R_4]^+X^- \qquad (II)$$

wherein X is an anion; R_1 is an alkyl, phenyl, or alkaryl group having 1 to 25 carbon atoms; each of R_2 and R_3 is a methyl, ethyl, hydroxyethyl or cyanoethyl group; and R_4 is either



wherein R_5 is hydrogen or alkyl of from 1 to 18 carbon atoms and R_6 is hydrogen or an alkyl group having 1 to 4 carbon atoms; at least one of R_1 and R_5 having an alkyl chain of at least 6 carbon atoms; and

b. a pH buffering compound selected from the group consisting of:

i. the alkali metal salts and acid salts of phosphoric acid, the polyphosphoric acids, boric acid, and;

ii. the acids and corresponding alkali metal salts of citric acid, lactic acid, glycolic acid, malic acid, tartaric acid, acetic acid, capric acid, benzoic acid, and adipic acid; or mixtures thereof in an amount sufficient to substantially maintain the pH of a solution containing component (a) at a level of from about 0.001 percent to about 0.5 percent by weight at less than, equal to , or not greater than 2 pH units above the pKa of component (a).

3,897,349

ANTI-RUST ADDITIVE COMPOSITION

Pierre Dominique Marin, Rouen, and Robert Tirtiaux, Mont Saint-Aignan, both of France, assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed May 29, 1974, Ser. No. 474,257

Claims priority, application France, May 29, 1973, 73.19388

Int. Cl. C10m *1/32, 3/26*

U.S. Cl. 252—33.3 **12 Claims**

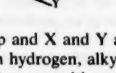
1. An anti-rust additive composition comprising:

a. at least one salt of at least one aliphatic carboxylic acid having 6 to 20 carbon atoms per molecule and at least one alkanolamine,

b. at least one salt of at least one aromatic carboxylic acid having up to 20 carbon atoms per molecule and at least one alkanolamine, the weight ratio, calculated as free acid, of aromatic acid to aliphatic acid being 0.1 : 1 to 10 : 1, and

c. at least one alkanolamine in the free state so that, in total, there are 1.5 to 3.0 equivalents of alkanolamine present per equivalent of acid;

the alkanolamines being compounds containing up to 20 carbon atoms per molecule and having the formula



, where R is a hydroxyalkyl group and X and Y are the same or different groups selected from hydrogen, alkyl and hydroxyalkyl.

11. An emulsifiable composition comprising a composition as claimed in claim **1**, further containing a sodium alkylbenzene sulphonate emulsifying agent.

12. The composition of claim **11**, further containing a mineral oil base having a viscosity of 10 to 200 cst at 50°C, and wherein the amount of the emulsifier is from 10 to 30 weight percent and the amount of the anti-rust additive composition is from 1 to 5 weight percent.

3,897,350
ANTI-RUST COMPOSITIONS

El-Ahmadi Ibrahim Heiba, Princeton, and Albert Lloyd Williams, Hopewell Twp., both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 30, 1974, Ser. No. 474,495
Int. Cl. C10m *1/40, 1/32, 1/20*
U.S. Cl. 252—33.4 13 Claims

1. An oil composition comprising a lubricating oil medium and, in amount sufficient to provide rust inhibiting properties thereto, (1) a naphthol selected from the group consisting of 1-naphthol, 2-naphthol and 1-nitroso-2-naphthol and (2) a metal sulfonate selected from the group consisting of neutral alkali metal sulfonate, neutral alkaline earth metal sulfonate, neutral zinc sulfonate, overbased alkali metal sulfonate, overbased alkaline earth metal sulfonate, and overbased zinc sulfonate.

5. The composition of claim 1 wherein there is also present in a detergent amount a long-chain hydrocarbyl-substituted organic condensation product having from 20 to 300 carbon atoms in the hydrocarbyl group, said product being selected from the group consisting of alkenylsuccinimides, alkenylsuccinic esters, alkyllactone amides, alkyllactam amides, and Mannich bases.

3,897,351
LUBRICANT COMPOSITIONS

Robert H. Davis, Pitman, and John W. Schick, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 4, 1973, Ser. No. 403,692
Int. Cl. C10m *1/32*
U.S. Cl. 252—34 12 Claims

1. A lubricant composition containing a corrosion-inhibiting amount of an alkanolamine salt of the reaction product of at least one member of the group consisting of alkyl and alkenylsuccinic anhydrides and at least one member of the group consisting of benzotriazole and tolyl triazole in a mole ratio of from 1:1 to 1:2.

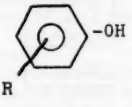
3,897,352
SULFURIZED NITRATED ALKYLPHENOL SALTS AND LUBRICANT COMPOSITIONS THEREOF

Harry Chafetz, Poughkeepsie, and Rodney L. Sung, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

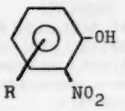
Filed Dec. 21, 1973, Ser. No. 427,154
Int. Cl. C10m *1/54*
U.S. Cl. 252—42.7 7 Claims

1. A sulfurized Group II metal nitrated alkylphenolate having a metal ratio of between about 1 and 3, a sulfur content of between about 0.1 and 10 wt. % and a nitrogen content of between about 0.3 and 6 wt. %, comprising:

a. contacting an alkylphenol of the formula:

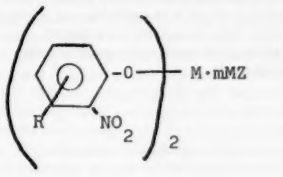


where R is an alkyl group of from 6 to 30 carbons with a nitrating agent selected from the group consisting of aqueous nitric acid, NO_2, N_2O_4, N_2O_3, N_2O_5 or mixtures of alkali or alkaline earth metal nitrates and mineral acid at a temperature between about 0° and 100°C. utilizing a mole ratio of alkylphenol to nitrating agent of between about 1:1 and 1:4 to form nitroalkylphenol characterized by the formula:



where R is as heretofore defined,

b. contacting said nitroalkylphenol with a Group II metal reagent selected from the group consisting of MO, $M(OH)_2$, and $M—O—A—OR')_2$ where M is a Group II metal, A is alkanediyl of from 1 to 6 carbons and R' is alkyl of from 1 to 25 carbons at a temperature between about 80° and 200°C. to form a Group II metal salt characterized by the formula:



where R and M are as heretofore defined and Z is an anion selected from the group consisting of $O^=$, $—OH)_2^=$ and $—O—A—OR')_2$ where A and R' are as heretofore defined,

c. contacting said Group II metal salt with sulfur at a temperature between about 120° and 230°C. utilizing a mole ratio of said metal salt to said sulfur of between about 1:1 and 1:10 to form said sulfurized Group II metal nitrated alkylphenolate.

3,897,353
METHOD OF PREVENTING HAZE IN OIL CONCENTRATES CONTAINING AN AMORPHOUS ETHYLENE-PROPYLENE COPOLYMER VISCOSITY INDEX IMPROVER

Abraham Morduchowitz, Monsey, and James G. Dadura, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,567
Int. Cl. C10m *1/32*
U.S. Cl. 252—51.5 A 7 Claims

1. A process of preventing haze in an oil additive concentrate comprising (a) a hydrocarbon solvent, (b) 0.5 to 20 wt. percent, based on solvent, of a polymeric pour depressant prepared from monomers selected from the group consisting of (1) C_4–C_{22} n-alkyl methacrylates and mixtures thereof, (2) a C_4–C_{22} n-alkyl methacrylate, mixtures thereof, and a dialkylaminoalkylmethacrylate and (3) a C_4–C_{22} n-alkyl methacrylate, mixtures thereof and a N(alkanone) acrylamide and (c) 5 to 30 wt. percent, based on solvent, of an ethylene-propylene copolymer having an amorphous structure, a number average molecular weight between about 10,000 and 100,000, a propylene content of 20 to 70 mole percent and a M_w/M_n of less than about 5 which comprises admixing the hydrocarbon solvent and the ethylene-propylene copolymer with the polymeric pour depressant, the polymeric pour depressant having a number average molecular weight of about 30,000 to 120,000.

3,897,354

COBALT-CONTAINING ACICULAR FERRIMAGNETIC IRON OXIDE OF IMPROVED REMANENCE STABILITY

Peter Woditsch, Krefeld, and Lutz Leitner, Rumeln-Kaldenhausen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 12, 1973, Ser. No. 350,568

Claims priority, application Germany, Apr. 29, 1972, 2221218

Int. Cl. C01g *49/08*; C04b *35/26*, *35/64*

U.S. Cl. 252—62.56 5 Claims

1. In the production of acicular ferrimagnetic material consisting essentially of γ-iron oxide and about 0.5 to 10 atom % of cobalt including the steps of producing cobalt-containing iron oxide hydroxide, dehydrating the oxide hydroxide to oxide, reducing the oxide and re-oxidizing it into ferrimagnetic iron oxide, the improvement which comprises tempering the material in air at a temperature of about 600° to 800°C prior to reduction for a time such that the ferrimagnetic iron oxide exhibits increased remenence stability compared with untempered oxide.

3,897,355

METHOD OF MAKING PERMANENT FERRITE MAGNETS

Ronald H. Arendt, and William J. Dondalski, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 26, 1973, Ser. No. 354,878

Int. Cl.[2] C04B *33/32*, *35/26*; H01F *1/11*

U.S. Cl. 252—62.58 3 Claims

1. In a method of making a permanent magnet from a magnetoplumbite ferrite powder having the formula $MFe_{12}O_{19}$, wherein M is selected from the group consisting of strontium and barium, including the steps of orienting the ferrite powder to align the crystals and wet pressing the powder to form a green compact, sintering the green compact at a temperature of about 1100°–1300° C. for a sufficient time to form a body having a density of at least 90% of the theoretical density and magnetizing the sintered ferrite composition, the improvement comprising homogeneously dispersing in the ferrite powder 0.5–6.0 percent by weight of a liquid phase sintering additive selected from the group consisting of the following systems:

$BaO—Al_2O_3—SiO_2$
$BaO—Al_2O_3—B_2O_3—SiO_2$
$SrO—Al_2O_3—SiO_2$
$SrO—Al_2O_3—B_2O_3—SiO_2$

3,897,356

WINDSHIELD WIPERS CONTAINING NONIONIC SURFACTANT

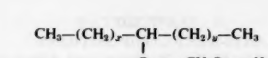
Alex Pociluyko, Glen Mills, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Feb. 28, 1973, Ser. No. 336,771

Int. Cl. C11d *17/04*, *1/72*

U.S. Cl. 252—91 3 Claims

1. A wiper for glass surfaces consisting essentially of a wet-strengthened paper sheet containing an active amount of a nonionic detergent surfactant of the following general formula:



wherein x and y are integers each having a value of from 0 to 14 and the sum of x plus y is from 10 to 14.

3,897,357

BACTERIOSTATIC TOILET BOWL CLEANER COMPOSITIONS

Robert Carmello, Dumont; Barry A. Salka, Clifton, and Garland G. Corey, Milltown, all of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 6, 1972, Ser. No. 312,767

Int. Cl. C11d *3/48*

U.S. Cl. 252—106 10 Claims

1. A method for preventing the growth or multiplication of *E. Coli* in toilet bowls which comprises dispensing into the water of a toilet an antibacterial liquid composition consisting essentially of:

Ingredient	% By Weight
Isopropanol	10–20
5-chloro-2-(2,4-dichlorophenoxy)phenol	0.5–6
Alkoxylated primary fatty alcohol	0.1–20
Linear alkyl aryl sulfonate salt	0.5–20
Sodium hydroxide	0–2
Water, dye, perfume	Sufficient to make up to 100%

wherein 5-chloro-2(2,4-dichlorophenoxy)phenol is present at a use dilution level in amounts of about 0.2 parts per million to less than 3.0 parts per million and wherein the alkyl chain length of the alkoxylated primary alcohol is from about 12 carbon atoms to about 18 carbon atoms.

3,897,358

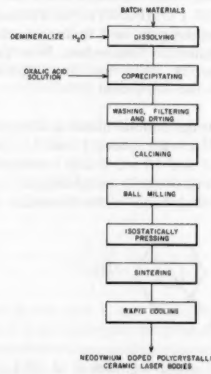
POLYCRYSTALLINE CERAMIC LASERS

Charles D. Greskovich, and Walter L. Roth, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 294,017, March 1, 1971, abandoned. This application Dec. 14, 1973, Ser. No. 424,809

Int. Cl.[2] C09K *11/04*

U.S. Cl. 252—301.1 R 7 Claims



1. A method of making a ceramic laser consisting essentially in mole percent as calculated from the batch on the oxide basis of 81–97.5 percent Y_2O_3, 2–15 percent ThO_2 and 0.5–4 percent Nd_2O_3, said method comprising the steps of:

a. forming an aqueous solution consisting essentially of the water soluble salts of yttrium, thorium, and neodymium in an amount corresponding to the percent of oxides set forth above;
b. coprecipitating the cations from solution with oxalic acid to form an insoluble mixed precipitate of yttrium oxalate, thorium oxalate and neodymium oxalate;
c. recovering the oxalate precipitate;
d. calcining the precipitate to convert the oxalates to the oxides;
e. particulating the oxides in a vulcanized rubber-lined ball mill;
f. pressing the powdered oxides into a green body;
g. sintering the green body in a hydrogen atmosphere at a temperature of about 1900°–2200° C.; and
h. rapidly cooling the sintered body at a rate of 10°–80° C. per minute between the sintering temperature and 800° C. and cooling the body to room temperature to form a polycrystalline ceramic laser.

3,897,359

EUROPIUM ACTIVATED ALKALINE EARTH METAL ALUMINO SILICATE PHOSPHOR AND METHOD FOR PREPARING THE SAME

Yoshichika Kobayashi, Ibaragi; Mutsuo Masuda, Kyoto, and Masanori Takagawa, Osaka, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed June 2, 1970, Ser. No. 42,692
Claims priority, application Japan, June 11, 1969, 44-47060
Int. Cl. C09k *1/54, 1/68*
U.S. Cl. 252—301.4 F **6 Claims**

1. A phosphor which comprises a solid solution of a complex oxide of alkaline earth metal, aluminum and silicon, which contains oxides of at least one of alkaline earth metals selected from calcium, strontium and barium, aluminum and silicon, and europium as an activator, whose chemical composition is represented by the following formula:

$$(Ca_x\ Sr_y\ Ba_z\ Eu_p)\ O_{x+y+z+p}\ Al_2O_3\cdot 2SiO_2$$

where

$$0.95 \quad x+y+z+p \quad 1.05$$
$$0.005 \quad p \quad 0.1$$

3,897,360

MANGANESE AND CERIUM ACTIVATED BARIUM CALCIUM ORTHOPHOSPHATE PHOSPHOR

Costas C. Lagos, Danvers, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Oct. 10, 1972, Ser. No. 296,012
Int. Cl. C09k *1/36*
U.S. Cl. 252—301.4 P **2 Claims**

1. A barium calcium orthophosphate phosphor activated by manganese and trivalent cerium, stable to fluorescent lamp processing and operation and to air firing, having the same crystalline structure as beta calcium orthophosphate and having the formula

$$Ba_aCa_b(PO_4)_2{:}Ce_cMn_d$$

wherein a is between 0.1 and 0.45 moles, c is between 0.05 and 0.25 moles, d is between .07 and .2 moles, and b has such a value that the total positive charges of Ba^{+2}, Ca^{+2}, Ce^{+3} and Mn^{+2} is between 5.85 and 6.0.

3,897,361

PROCESS FOR PRODUCING MICROCAPSULES

Keiso Saeki; Hiroharu Matsukawa, and Akio Watanabe, all of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Sept. 13, 1972, Ser. No. 288,835
Claims priority, application Japan, Sept. 13, 1971, 46-71064
Int. Cl. B01j *13/02;* **B44d** *1/02, 1/44*
U.S. Cl. 252—316 **12 Claims**

1. A process for producing microcapsules of a hydrophobic oil solution comprising the sequential steps of adding at least one polyisocyanate compound, polyisothiocyanate compound, or a prepolymer thereof, to said hydrophobic oil solution in an amount sufficient to provide microcapsule walls with low porosity; preparing an emulsion of said hydrophobic oil solution in a coacervate dispersion comprising at least two hydrophilic high molecular weight compound colloids having opposite electrical charges from each other; then causing complex coacervation to form coacervate walls of said at least two colloids around droplets of said hydrophobic oil solution by adding water thereto, adjusting the pH thereof or by a combination of adding water and adjusting the pH; cooling to cause gelling of the coacervate walls and hardening said coacervate walls by a combination of adding a hardening agent to the system and adjusting the pH of the system to an alkaline condition.

3,897,362

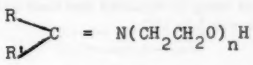
STABILIZED SURFACTANTS AND THEIR PREPARATION

David Ross McCoy, Wappingers Falls, N.Y.

Continuation-in-part of Ser. No. 863,368, Oct. 2, 1969, abandoned. This application Oct. 24, 1972, Ser. No. 299,964
Int. Cl. B01f *17/16*
U.S. Cl. 252—357 **7 Claims**

1. A substantially water soluble or water dispersible surfactant mixture having good stability in aqueous solution in the pH range of about 5.6 to 13, consisting essentially of, as its surfactant component:

a. at least 0.1% by weight of said surfactant mixture as ethoxylated Schiff base of the structure:



wherein R and R' are alkyl groups where each of said groups contain at least two carbon atoms, the sum of said alkyl groups totaling from 9 to 14 carbon atoms and *n* which represents the average degree of ethoxylation varies between 7 to 13, and

b. at least 0.002% by weight of the methyl alkyl ketone self-condensates obtained from the condensation of ethanolamine with ketonic dimers, said condensates having an average molecular weight of 350–450 and a nitrogen content of 3–4% by weight, the methyl alkyl ketone condensates being present in a concentration of at least 2% by weight and up to 35% by weight of the ethoxylated Schiff base condensates, the condensates being derived from the reaction of at least one methyl alkyl ketone containing 10 to 15 carbon atoms with ethanolamine, at temperatures ranging from 50°C and up, said surfactant mixture having a pH in a 1% by weight aqueous solution of about 10 to 13.

3,897,363

BLOOD CONTROL STANDARD

Allan L. Louderback, Temple City, and Anthony J. Fontana, Glendora, both of Calif., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Aug. 10, 1973, Ser. No. 387,419
Int. Cl. C09k 3/00; G01n 31/00, 33/00
U.S. Cl. 252—408 6 Claims

1. The method of making a blood control standard from anticoagulant stored, defibrinated blood plasma containing elevated levels of dextrose which comprises selectively destroying dextrose in said blood plasma by aerobic fermentation with agitation utilizing 0.1 to 10 grams of a yeast in the negative acceleration phase or in the stationary phase of the yeast growth per liter of said plasma and separating particulate residue from the fermentation product.

3,897,364

PROCESS FOR THE PREPARATION OF CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Paolo Colombo, Saronno, and Marco Galliverti, Legnano, both of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 27, 1972, Ser. No. 318,812
Claims priority, application Italy, Dec. 27, 1971, 32949/71
Int. Cl. B01j 11/84
U.S. Cl. 252—429 C 11 Claims

1. Process for the preparation of catalysts suitable for the production of polymers of ethylene and alpha-olefins and of copolymers of ethylene with alpha-olefins, consisting essentially of an organo-metallic compound and the product of interaction between a halogenated compound of a transition metal and a solid granular support, characterized in that at a temperature between 100 and 350°C and for a period of 10 to 30 hours, a halide transition metal in groups IVB and VB of the periodic system is caused to react with a solid granular support obtained by deposition of metallic aluminum on an alumina, silica, silico-alumina or mixtures thereof with a surface area at least greater than 10 sq.m/g and a granulometric distribution of between 10 to 150 microns, obtained a after activation at a temperature of between 350 and 900°C for a period of 2 to 25 hours, such deposition being carried out in such a way that the end product has a content of highly dispersed aluminum comprised between 0.05 and 5% by weight, the relative quantities of transition metal halide and solid support used in the reaction being so regulated that the molar ratio of transition metal halide to supported metallic aluminum is between 100 and 1000, and in that, at a temperature of 20° to 100°C the product of such reaction is brought into contact with an organometallic compound chosen from aluminum trialkyls, halides of dialkyl aluminum, or zinc dialkyls, the relative quantities of organometallic compounds and of fixed transition metal being so regulated that their molar ratios are comprised between 5 to 100.

3,897,365

HYDROTREATING CATALYST AND PROCESS THEREFOR

Irvin Ralph Feins, Westport, and Robert Murphy Yarrington, Old Greenwich, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 20, 1973, Ser. No. 399,217
Int. Cl. B01j 11/82
U.S. Cl. 252—435 5 Claims

1. A process for preparing a pre-cracking hydrotreating catalyst which comprises: (I) uniformly admixing an aqueous ammonium molybdate solution with an inorganic oxide gel consisting of at least 50 weight percent alumina, up to about 50 weight percent silica, and up to a total 10 weight percent of titania, zirconia, or vanadia, said gel percentages totaling 100, the amount of ammonium molybdate solution admixed being sufficient to provide from about 5 to 15 weight percent molybdenum oxide based on the total calcined weight of molybdenum oxide and inorganic oxide gel: (II) forming the resulting mixture into a catalyst support: (III) drying and calcining the formed support; (IV) impregnating the calcined support with an aqueous orthophosphoric acid solution of a nickel source and a molybdenum source so as to provide on said support from about 1.0 to 3.5 weight percent phosphorus, from about 1 to 6 weight percent nickel oxide, and from about 10 to 20 weight percent molybdenum oxide, said percentages being based on the total calcined weight of said catalyst and the total percentage of molybdenum oxide resulting from said support and impregnation being greater than 20 weight percent and less than about 35 weight percent based on the weight of the calcined catalyst; and (V) drying and calcining the impregnated support.

3,897,366

AUTOMOTIVE EXHAUST GAS CATALYST

Harutoki Nakamura, Toyonaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Japan

Continuation of Ser. No. 163,939, July 19, 1971, Pat. No. 3,811,845. This application Nov. 5, 1973, Ser. No. 412,961
Claims priority, application Japan, July 30, 1970, 45-67146; July 30, 1970, 45-67147; May 12, 1971, 46-32076
Int. Cl. B01f 11/06
U.S. Cl. 252—454 3 Claims

1. A catalyst for the treatment of automobile exhaust gas comprising

a plurality of bodies of woven mesh of glass fibers which are etched to remove alkalinity thereby forming a high silica glass,

a deposit of catalytic material selected from the group of metals, metal oxides or mixtures thereof on said fibers in which said catalytic material oxidizes carbon monoxide and hydrocarbons and reduces nitrogen oxides in automobile exhaust gas and

heat conductive metal partitions subdividing said bodies to dissipate the heat therefrom.

3,897,367

METAL OXIDE CATALYTIC COMPOSITIONS

Alan Lauder, Newark, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Oct. 10, 1973, Ser. No. 405,052
Int. Cl. B01j 11/08, 11/22
U.S. Cl. 252—462 7 Claims

1. A compound having the perovskite-type ABO_3 crystal structure wherein

from about 1 to up to 20% of the B cation sites are occupied by ruthenium or platinum ions and the remainder of the B cations sites are occupied by ions consisting essentially of cobalt ions, and

the A cation sites are occupied by lanthanide ions of atomic number 57 to 71 and ions of at least one metal of Groups IA, IIA and IVA of the Periodic Table having ionic radii of about 0.9A to 1.65, and proportioned so that no more than 50% of the cobalt ions are tetravalent and the remaining cobalt ions are trivalent.

3,897,368

METHOD FOR THE PRODUCTION OF NOBLE METAL CATALYSTS

Takashi Ohara, Nishinomiya; Shoichi Ichihara, Toyonaka; Koichi Saito, Suita, and Tetsuji Ono, Amagasaki, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Nov. 29, 1973, Ser. No. 419,948
Claims priority, application Japan, Nov. 30, 1972, 47-119395; Feb. 28, 1973, 48-23133; Mar. 6, 1973, 48-25671
Int. Cl. B01j 11/08
U.S. Cl. 252—466 PT 16 Claims

1. In the production of noble metal catalysts in which a noble metal is supported onto a refractory porous inorganic

support from an aqueous medium containing a noble metal or compound thereof, the improvement comprising

a. depositing a high concentration of said noble metal on the surface of a refractory porous support having an average particle diameter of 1.5 to 15 mm. by impregnating said support with an aqueous solution or dispersion of said noble metal or a compound thereof in the presence of a nonionic surface active agent of the poly (oxyethylene) type having an average molecular weight of at least 500, and

b. subjecting the resulting supported catalyst to activation.

3,897,369

CATALYST

Brent J. Bertus, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 242,373, April 10, 1972, Pat. No. 3,810,954. This application Dec. 3, 1973, Ser. No. 420,878

Int. Cl. B01j *11/32*

U.S. Cl. 252—469 **4 Claims**

1. A calcined solid oxidative dehydrogenation catalyst composition consisting of a metal selected from the group consisting of nickel and cobalt, in association with tungsten, tin and oxygen, characterized by the formulae

$$NiW_xSn_yO_z \text{ and } CoW_xSn_yO_z$$

respectively, wherein x and y are numbers having a value in the range of about 0.1 to about 1 and z is a number determined by the valence requirements of said nickel or cobalt, said tungsten and said tin components.

3,897,370

AROMA COMPOSITIONS CONTAINING CYCLOALIPHATIC CROTONYL COMPOUNDS

Erich Klein, Holzminden, Germany, assignor to Dragoco Spezialfabrik Konzentrierte Riech-und Aromastoffe Gerberding & Co. GmbH, Holzminden, Germany

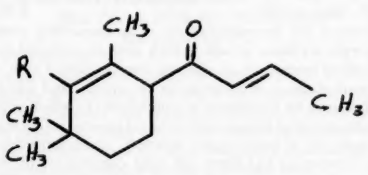
Division of Ser. No. 146,554, May 24, 1971, Pat. No. 3,822,315. This application Nov. 3, 1972, Ser. No. 303,352

Claims priority, application Germany, Apr. 26, 1971, 2120413

Int. Cl. A61k *7/00;* **C11b** *9/00*

U.S. Cl. 252—522 **3 Claims**

1. Aroma composition comprising a perfume mixture including an aroma modifying effective amount, sufficient to enrich natural perfumes or artificial aromas, of a trans isomer of a compound of the formula:



wherein R is selected from the group consisting of hydrogen and lower alkyl.

3,897,371

METHOD OF FORMING A WATER-EXTENDED ACRYLIC POLYMER

John Lewis Moilliet, Abberley, and James Ernest Ryan, Knebworth, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 8, 1973, Ser. No. 368,024

Claims priority, application United Kingdom, June 14, 1972, 27749/72

Int. Cl. C08f *47/08*

U.S. Cl. 260—2.5 L **9 Claims**

1. A method of forming a water-extended acrylic polymer, comprising emulsifying a mixture of 60–88% by weight of water and 40–12% by weight of a 0.5–5% by weight solution of an acrylic soluble ethyl cellulose in a water-immiscible polymerisable acrylic liquid at least 80% by weight of which is methyl methacrylate, wherein the water and the acrylic liquid respectively comprise the disperse and continuous phases of the emulsion; and polymerising the acrylic liquid while maintaining the emulsion.

3,897,372

SMOKE-FLAME RETARDANT HYDROPHILIC URETHANE AND METHOD

Clifton Leroy Kehr, Silver Spring; Robert M. Murch, Ashton, and Nelson Samuel Marans, Silver Spring, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 17, 1974, Ser. No. 461,675

Int. Cl.² C08G *18/14, 18/10;* **C08K** *3/20, 3/38*

U.S. Cl. 260—2.5 AJ **12 Claims**

1. In a polyurethane foam composition formed by reacting a resin prepolymer and a water reactant the improvement which comprises incorporation of a smoke-flame retardant, said retardant consisting essentially of alumina hydrate having an average particle size of about 0.5 to about 120 microns and disposed in an amount of about 50 to about 400 parts by weight per 100 parts prepolymer resin to be reacted, in combination with boric acid and an equal part by weight of a melamine containing compound selected from the group consisting of melamine, melamine-formaldehyde resin, butylated-melamine resin, melamine-acrylic resin wherein said melamine containing compound is included in an amount from about 1 to about 200 parts by weight per part by weight of resin polymer reactant used for polyurethane generation.

2. The polyurethane composition of claim 1 wherein the retardant component further includes silica.

3,897,373

SELF-EXTINGUISHING THERMOPLASTIC MOLDING COMPOSITIONS

Robert Bachl, Worms, and Herbert Naarmann, Wattenheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

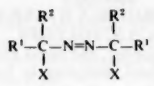
Filed Apr. 8, 1974, Ser. No. 458,525

Claims priority, application Germany, Apr. 21, 1973, 2320535; Oct. 25, 1973, 2353438

Int. Cl. C08f *47/10;* **C08j** *1/26*

U.S. Cl. 260—2.5 FP **9 Claims**

1. Self-extinguishing thermoplastic molding compositions based on styrene polymers and containing an organic bromine compound containing at least four carbon atoms and more than 40 wt % of bromine as flameproofer and from 0.01 to 5% by weight of an azo compound of the formula



where R^1 and R^2 denote aliphatic, cycloaliphatic or araliphatic radicals of from one to 12 carbon atoms and X denotes chlorine or bromine or an aliphatic, cycloaliphatic or araliphatic radical of from one to 12 carbon atoms.

3,897,374

NONSTAINING RUBBER

Masaaki Takahashi, Tokyo; Noboru Ishizawa, Hyogo, and Masazo Nishida, Osaka, all of Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka and Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, both of, Japan, part interest to each

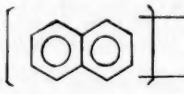
Continuation-in-part of Ser. No. 153,047, June 14, 1971, abandoned. This application Jan. 4, 1974, Ser. No. 430,852

Claims priority, application Japan, June 12, 1970, 45-51196

Int. Cl. C07c *15/24*; **C08c** *11/22*

U.S. Cl. 260—5 **11 Claims**

1. A rubber composition containing therein 5–50 parts by weight per 100 parts by weight of a rubber component, of a nonstaining aromatic hydrocarbon oil which consists essentially of polypropylnaphthalene of the general formula,



wherein R is propyl group, n is an integer of 2 to 4, R' is a hydrogen atom or a methyl group and n' is an integer of 1 and 2, the total number of carbon atoms is the alkyl side chains being six to 13, and said oil having an aniline point of not more than 10°C and a boiling point ranging from 280° to 450°C.

3,897,375

MINERAL-PIGMENT AND BUTADIENE COPOLYMER BINDER PAPER COATING COMPOSITIONS

Akikazu Takahashi, Matsudo; Yuji Futatsugi, Chiba; Hiroo Wakayama, Funabashi, and Takamu Yao, Narashino, all of Japan, assignors to Dainippon Ink & Chemicals Inc., Tokyo, Japan

Filed Nov. 26, 1973, Ser. No. 419,059

Int. Cl. C08h *7/00*

U.S. Cl. 260—8 **4 Claims**

1. A paper coating composition comprising

1. 100 parts by weight of a mineral pigment;

2. 3 – 35 parts by weight, calculated as solids, of an aqueous solution of a pH of at least 8 wherein has been dissolved a member selected from the group consisting of an ammonium salt, an alkali salt and an amine salt of a copolymer of 20 – 70 weight % of butadiene, 20 – 80 weight % of at least one monoethylenically unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, fumaric acid, maleic acid and crotonic acid and 0 – 60 weight % of a third monomer selected from the group consisting of methyl acrylate, methyl methacrylate, ethyl acrylate, ethyl methacrylate, styrene, alpha-methylstyrene, acrylonitrile, methacrylonitrile, vinyl chloride and vinyl pyridine; and

3. 1 – 30 parts by weight, calculated as solids, of a carboxylated synthetic rubber latex.

3,897,376

ROOM TEMPERATURE VULCANIZABLE SILICONE RUBBER COMPOSITION

Warren R. Lampe, Ballston Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 76,265, Sept. 28, 1970, Pat. No. 3,696,090. This application Mar. 17, 1972, Ser. No. 235,822. The portion of the term of this patent subsequent to Oct. 3, 1989, has been disclaimed.

Int. Cl. C08f *21/01*

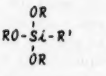
U.S. Cl. 260—18 S **6 Claims**

1. The process for obtaining silicone rubber compositions which are cured at room temperatures to the solid, elastic state comprising mixing

a. a linear high molecular weight fluid organopolysiloxane containing terminal silicon-boned hydroxy groups and having a viscosity of 3×10^6 to 2×10^8 centipoise at 25°C where the organo groups are monovalent hydrocarbon radicals with 1-100% by weight of high molecular weight diorganopolysiloxane of a low molecular weight linear fluid diorganopolysiloxane containing terminal silicon-bonded hydroxy groups and having a viscosity of 100 to 3.0×10^5 centipoise at 25°C where the organo groups represent monovalent hydrocarbon groups,

b. dispersing into the organopolysiloxane mixture 10–50 percent by weight of filler based on the weight of organopolysiloxane mixture;

c. mixing in the above mixture and alkyl silicate selected from the class consisting of (1) a monomeric organo-silicate corresponding to the general formula,



where R is a radical selected from the class consisting of alkyl, haloalkyl, aryl, haloaryl, aralkyl, alkenyl, cycloalkyl, cycloalkenyl and cyanoalkyl radicals and R' is selected from the class consisting of alkyl, haloalkyl, aryl, haloaryl, alkenyl, cycloalkyl, cycloalkenyl, cyanoalkyl, alkoxy and aryloxy radicals, and (2) a liquid partial hydrolysis product of the aforementioned organosilicate monomeric compounds and

d. dispersing into the above resulting mixture a metallic salt of an organic monocarboxylic acid in which the metal ion is selected from the class consisting of lead, tin, zirconium antimony, iron, calcium barium, cadmium, titanium, bismuth, and manganese.

3,897,377

PROCESS FOR THE MANUFACTURE OF SYNTHETIC RESINS WITH URETHANE GROUPS, WHICH ALSO CONTAIN CARBOXYL GROUPS AND CAN BE DILUTED WITH WATER

Bernhard Broecker, Hamburg, and Wolfram Plettner, Glinde, both of Germany, assignors to Reichold-Albert-Chemie Aktiengesellschaft, Hamburg, Germany

Filed Dec. 12, 1973, Ser. No. 424,111

Claims priority, application Switzerland, Dec. 14, 1972, 018260/72

Int. Cl.² C08G *22/16*, *22/32*, *51/24*

U.S. Cl. 260—18 TN **8 Claims**

1. Process for the manufacture of thermosetting synthetic resins with urethane groups, which contain carboxyl groups and masked isocyanate groups and can be diluted with water after neutralization with ammonia or amines, and which are manufactured by reaction of a compound (a) which contains alcoholic hydroxyl groups and carboxyl groups, with a masked isocyanate (*b*) in inert organic solvents, characterized in that as the compound (*a*) there are used copolymers of two or more vinyl monomers, individually or as mixtures thereof, which contain alcoholic hydroxyl groups and carboxyl groups, have a molecular weight of about 300 to 10,000, a hydroxyl

equivalent weight of 200 to 900 and acid numbers of about 30 to 150, based on carboxyl groups, and which must be soluble in inert polar organic solvents, only those copolymers being employed of which the carboxyl groups are not capable of significant reaction with masked isocyanate groups at temperatures of 80° to 150°C over the course of about one hour, and as the masked isocyanate (*b*) there is used a polyurethane which contains at least one masked isocyanate group and which has been obtained by reaction of a polyisocyanate with a free isocyanate group and at least one masked isocyanate and at most up to 5 masked isocyanate groups with a compound carrying alcoholic hydroxyl groups, having a molecular weight of about 120–2,000 and a hydroxyl equivalent weight of about 60–500, the compound having been chosen from the group consisting of esters of fatty acids with polyols, wherein the polyols should be at least trifunctional, and diols which carry terminal hydroxyl groups and in which 3 to 8 carbon atoms are aliphatically bonded between the hydroxyl groups, and that the components (*a*) plus (*b*) are reacted at temperatures of 80°–150°C, that the component (*a*) is employed in such amounts that the end product has acid numbers between about 30 and 120, that thee proportion of calculated isocyanate groups introduced when manufacturing the component (*b*) is between 7.5 and 20 percent by weight relative to the weight of the end product and that the end product is completely soluble in a 50 percent strength solution in ethylene glycol monobutyl ether and has a viscosity between 150 and 700 cP in this solution at 25°C and that the amount of the component (*b*) which is employed is such that the mixture of components (*a*) plus (*b*) before reaction contains 2 to 15 percent by weight of masked isocyanate groups relative to the sum of (*a*) plus (*b*).

3,897,378
BINDER RESINS FOR TRAFFIC PAINTS

John M. Scohy, Vienna, W. Va.; George E. Cremeans, Groveport, and Manfred Luttinger, Columbus, both of Ohio, assignors to Borg-Warner Corporation, Chicago, Ill.

Filed May 29, 1974, Ser. No. 474,297
Int. Cl. C09d *3/66*
U.S. Cl. 260—22 CB **6 Claims**

1. In a traffic paint formulation comprising an alkyd resin, a chlorinated paraffin plasticizer, a second binder resin, pigments, fillers and a solvent mixture, the improvement wherein said second binder resin is an alkyd compatible graft polymer comprising from about 50 to about 90% by weight of an alkylstyrene selected from the group vinyl toluene, ethylstyrene, propylstyrene, and butylstyrene, from about 0.5% to about 5% by weight of a C_1 to C_7 conjugated diene, from about 49.5% to about 10% by weight of an acrylic acid ester of a C_2–C_{10} alcohol.

3,897,379
TIME BASE ERROR CORRECTION FOR RECORDING SYSTEMS

Richard E. De Francesco, Holland, Pa.; Bernard Harris, Dobbs Ferry, N.Y., and David Hoffman, Hillsdale, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1974, Ser. No. 512,835
Int. Cl. G11b *5/43*
U.S. Cl. 360—27 **13 Claims**

1. A time base error correcting system for FM tape recorders having a reference tone on a first tape track and data signals on a second tape track comprising, in combination:

first pulse generating means for producing a series of periodic output pulses having a frequency equal to the average frequency valve of said reference tone;

second pulse generating means adapted to receive said reference tone for producing a series of output pulses indicative of the zero crossings of said tone;

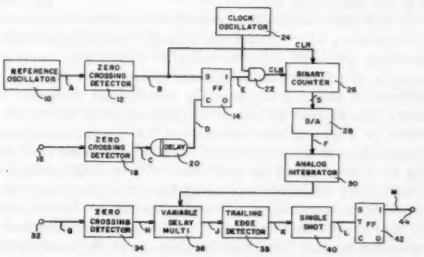
delay means connected to receive said second generating means output pulses for producing a time delayed replica output thereof;

pulse width encoding means connected to receive said first pulse generating means output signals and said delay means output for producing an output pulse having a variable width dependent upon the time separation between corresponding ones of said first pulse generating means output signals and said delay means output pulses;

clocking means connected to receive said pulse width encoding means output pulse for producing a series of periodic clock pulses for the duration of said output pulse;

counting means connected to receive said first pulse generating means output pulses and said clock pulses for producing a digital count indicative of the width of said pulse width encoding means output pulse upon the receipt of individual ones of said first pulse generating means output signals;

analog transformation means connected to receive said digital count for producing a smoothed analog signal representation of said digital count;



third pulse generating means adapted to receive said data signals for producing a series of output pulses indicative of the zero crossings of said data signals;

variable delay means connected to receive said third pulse generating means output pulses and said analog signal for delaying respective ones of said third pulse generating means output pulses for a time proportional to the value of said analog signal and for providing an output representative thereof;

fourth pulse generating means connected to receive said variable delay means output for producing a series of regularly shaped output pulses indicative of the trailing edges of respective ones of said variable delay means output pulses; and

fifth pulse generating means connected to receive said fourth generating means output pulses for producing a series of output pulses having widths corresponding to the sequential time occurrence of said fourth generating means output pulses;

whereby said fifth generating means output pulses are indicative of the data signals corrected for time base error.

3,897,380
RUBBERIZED COAL TAR PITCH EMULSION

John P. Walaschek, 4250 Galt Ocean Dr., Fort Lauderdale, Fla. 33308

Continuation of Ser. No. 337,930, March 5, 1973, Pat. No. 3,835,117. This application Mar. 18, 1974, Ser. No. 451,828
Int. Cl. C08f *45/52*
U.S. Cl. 260—28.5 AS **2 Claims**

1. In rubberized coal tar emulsion coating compositions, the improvement comprising an aqueous coal tar emulsion having admixed therewith 2.5 to 15 percent by weight, of an acrylonitrile/butadiene copolymer latex based upon the copolymer content in said latex and tar content in said aqueous coal tar

emulsion, said acrylonitrile/butadiene latex having an average particle size between 400 and 1000 A, and said acrylonitrile/butadiene copolymer containing 30–49 parts acrylonitrile and 70–51 parts butadiene, whereby said composition is characterized by a thixotropic nature.

3,897,381

PROCESS FOR PREPARATION OF THERMOSETTING RESINOUS COMPOSITIONS

Hideyoshi Tugukuni, Osaka; Masafumi Kano, Kyoto, and Yoshihisa Chikazoe, Osaka, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed Oct. 17, 1973, Ser. No. 407,158

Claims priority, application Japan, Oct. 21, 1972, 47-105644

Int. Cl. C08g *22/06, 22/20*

U.S. Cl. 260—29.2 TN **10 Claims**

1. A process for the preparation of thermosetting resinous compositions which comprises homopolymerizing or copolymerizing (*b*) and α,β-ethylenically unsaturated monomer capable of releasing an isocyanate group under heating or a mixture of said α,β-ethylenically unsaturated monomer and other unsaturated monomer copolymerizable therewith in water at a temperature lower than the isocyanate-releasing temperature in the presence of (*a*) a water-soluble resin having an acid group of an acid value of 5 to 3000 neutralized with a basic substance and being free of a group capable of releasing an isocyanate group under heating, to thereby obtain an aqueous polymer dispersion, said unsaturated monomer or monomer mixture being copolymerized with the water-soluble resin when the latter has an unsaturated bond, and being homopolymerized in the case of an unsaturated monomer or copolymerized in the case of a monomer mixture when the water-soluble resin has no unsaturated bond, the content of said isocyanate groups being from 0.05 to 10% by weight based on the total non-volatile solids, at least one of said components (*a*) and (*b*) containing active hydrogen-containing groups in components (*a*) and (*b*) being within the range of from 0.3 to 0.5, and the non-volatile component weight ratio of component (*a*) to component (*b*) being within a range of from 10:90 to 95:5.

3,897,382

METHOD FOR THE ACID HYDROLYSIS OF ACRYLONITRILE CONTAINING POLYMERS, HYDROGELS AND FIBERS OF PRODUCTS PREPARED BY SAID METHOD

Vladimir Stoy; Artur Stoy; Renata Urbanova; Jaroslav Prokop, and Josef Kucera, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved No. 3 Narodni, Prague, Czechoslovakia

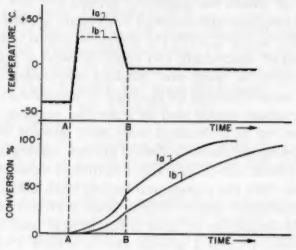
Continuation of Ser. No. 377,270, July 9, 1973, abandoned. This application Mar. 20, 1974, Ser. No. 453,080

Claims priority, application Czechoslovakia, July 14, 1972, 5011-72

Int. Cl. C08f *45/24*

U.S. Cl. 260—29.6 AN **19 Claims**

1. A method for the acid hydrolysis of acrylonitrile-containing polymers comprising hydrolyzing said polymers in the presence of about 40 to about 80% concentrated nitric acid at a temperature of about 25 to about 60°C, and cooling said acid reaction mixture to about −20° to about +30°C for a



period of time sufficient to reach the desired degree of hydrolysis.

3,897,383

2,2-DIALKYLEPOXIDES AS PLASTICIZERS, STABILIZERS, OR REACTIVE DILUENTS

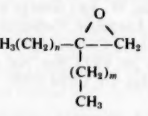
Robert Malone Gipson; Ernest Leon Yeakey, and William Jennings Pepel, all of Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Division of Ser. No. 263,678, June 16, 1972, Pat. No. 3,835,166. This application Apr. 17, 1974, Ser. No. 461,550

Int. Cl. C08f *45/32, 45/58*; **C08g** *51/32*

U.S. Cl. 260—30.4 N **5 Claims**

1. A process for improving the physical characteristics of resinous polymer selected from polyureas, polyurethanes or polyvinylchloride comprising admixing therewith an epoxide compound represented by the following formula:



wherein *n* and *m*, individually, are integers in the range of 3 to 21 and wherein the sum of *n* and *m* is an integer in the range of 8 to 24, and wherein from about 1 to 25 parts by weight of the epoxide is employed per 100 parts by weight of resinous polymer.

3,897,384

MOULDING COMPOSITIONS CONTAINING PHOSPHOROUS, TALC, AND, OPTIONALLY, METAL CARBONATE AS FILLERS

Wolfram Busch, Massenheim-Gartenstadt; Hans Paul Gilfrich, Wiesbaden-Biebrich; Albrecht Scholz, Hochheim, and Hermann Wallhauber, Wehen, all of Germany, assignors to Hoechst Aktiengesellschaft, Wiesbaden, Germany

Continuation of Ser. No. 264,539, June 20, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 458,642

Claims priority, application Germany, June 26, 1971, 2131845; July 22, 1971, 2136669

Int. Cl. C08g *51/04*

U.S. Cl. 260—40 R **13 Claims**

1. A thermosetting moulding composition comprising A) an unsaturated polyester derived from a carboxylic acid component selected from the group consisting of 1) terephthalic acid, isophthalic acid, and mixtures thereof and 2) an acid component selected from the group consisting of fumaric acid, maleic acid, and a combination thereof and from a dihydric alcohol, B) a copolymerizable monomer which is present in an amount of from 3 to 50% by weight of the polyester-monomer mixture, C) a per oxide catalyst, and D) an inorganic filler component which at least in part consists of finely

divided red phosphorus in an amount of from 0.2 to 10% by weight, based on the total moulding composition and a component selected from the group consisting of a) talc, and b) a combination of talc and an alkaline earth metal carbonate in a weight ratio of from 5:1 to 20:1, said talc being present in an amount of from 10 to 70% by weight based on the total moulding composition, and A) and B) being present in an amount of at least 10% by weight based on the total moulding composition.

3,897,385

PROCESS FOR THE PREPARATION OF COMPOSITE MATERIALS HAVING HIGH IMPACT STRENGTH AND STRONG RIGIDITY AND MATERIALS SO-OBTAINED

Michel Van Russelt, Brussels; Claude Bleiman, and Jean Mercier, both of Kessel-Lo, all of Belgium, assignors to Gerdec, Paris, France

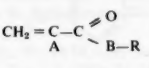
Filed July 11, 1973, Ser. No. 378,212

Claims priority, application France, July 11, 1972, 72.25032

Int. Cl. C08f *45/04*

U.S. Cl. 260—42.14 39 Claims

1. In a normally solid polymer composition comprising a vinyl aromatic polymer reinforced by a strengthening filler, the improvement wherein the strengthening filler comprises: a. 2–30 parts by weight per 100 parts by weight of vinyl aromatic polymer of a copolymer having a molecular weight M_r of at least 50,000 and consisting essentially of 100 molar parts of a vinyl aromatic monomer and 1–20 molar parts of an ethylenically unsaturated polar comonomer of the formula



wherein A is hydrogen or alkyl of 1–6 carbon atoms, B is oxygen or —NH— and R is an organic hydrocarbon chain of 1–12 carbon atoms bearing a hydroxy or an epoxy group, said polar comonomer being directly absorbed or reacted onto the surface of

b. 5–40 parts by weight, per 100 parts by weight of the total polymer content in the reinforced composition, of a particulate phyllosilicate capable of directly absorbing or reacting with said polar comonomer.

3,897,386

TIRE TREADS

Joseph C. Sanda, Jr., Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed June 8, 1972, Ser. No. 260,870

Int. Cl. B60c *1/00*; C08f *45/08*

U.S. Cl. 260—42.47 3 Claims

1. The method of producing a polyurethane tread for a pneumatic tire which comprises producing in one step a polyurethane by heating to curing temperature (a) a polyhydroxy elastomeric polymer of the class consisting of (1) homopolymers and copolymers of conjugated dienes which contain 4 to 6 carbon atoms and (2) copolymers of such a diene and an aromatic vinyl monomer or vinyl nitrile monomer, and (b) a diisocyanate or mixture of diisocyanates, and (c) 5 to 25 parts of N,N-bis(2-hydroxypropyl)aniline per 100 parts of dihydroxy polymer and (d) sufficient reinforcing agent to make the composition serviceable as a tread; the —NCO/—OH ratio of the polymer or polymers and the diisocyanate or diisocyanates being greater than 1.15 to 5.0.

3,897,387

FIRE RETARDANT AGENT

James D. O'Shaughnessy, Gouverneur, N.Y., assignor to James D. O'Shaughnessy, Gouverneur, N.Y.

Filed May 23, 1973, Ser. No. 363,212

Int. Cl. C08c *11/04*

U.S. Cl. 260—45.7 R 17 Claims

1. A fire retardant agent comprising a calcium or magnesium mineral borate or a calcium or magnesium metaborate and a halogen source, said halogen having an atomic weight greater than 19.

3,897,388

ANTIOXIDANT COMPRISING A HYDROXY AROMATIC COMPOUND CONTAINING SULFUR AND ORGANIC PHOSPHITE

Bernard J. Lyons, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 11, 1973, Ser. No. 405,553

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.8 R 6 Claims

1. An antioxidant composition suitable for use with polymers subject to oxidative degradation, especially irradiated and fire retardant plastics, comprising a mixture of hydroxy aromatic compounds containing sulfur selected from the group consisting of oligomers of 4,4′-thiobis (6-t-butyl-m-cresol) or the reaction product of phosphorus oxychloride and 4,4′ thiobis (6-t-butyl-m-cresol) and an organic phosphite compound of the general formula $[ROP(OR')_2]_nP_x$, wherein R is selected from the group consisting of alkyl, substituted alkyl, aryl and substituted aryl and R′ is selected from the group consisting of hydrogen, alkyl, substituted alkyl, aryl and substituted aryl wherein n is an integer from 1 to 3 and x is 0 or 1.

3,897,389

FLAME RETARDANT COMPOSITIONS

Irving Touval, Edison, N.J., assignor to M&T Chemicals Inc., Greenwich, Conn.

Division of Ser. No. 869,366, Oct. 24, 1969, abandoned. This application Mar. 15, 1971, Ser. No. 124,447

Int. Cl.[2] C08F *6/00*; C08G *83/00*

U.S. Cl. 260—45.75 B 8 Claims

1. a resin composition possessing enhanced flame retardant characteristics and consisting essentially of

1. a halogen-containing material selected from the group consisting of (a) halogen-containing polymers which are in turn selected from the group consisting of homopolymers and copolymers of vinyl chloride and halogen-containing polyolefins and (b) combinations of non-halogenated polymers with an organic halogen source, said non-halogenated polymers being in turn selected from the group consisting of polyesters and polymerized ethylenically unsaturated hydrocarbons, and
2. a flame-retarding amount of sodium antimonate, the particles of which exhibit an average size of about 1.5 micron, the size of the individual particles being between about 0.1 and 8 microns.

3,897,390

POLYSILOXANE COMPOUNDS HAVING AN ADAMANTANE BASE, AND METHODS OF PRODUCTION THEREOF

Alain Maurice Groult, Annemasse, France, and Günter G. Bellmann, Geneva, Switzerland, assignors to Etat Francais, Paris Armees, France

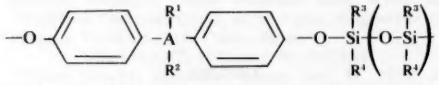
Filed May 23, 1974, Ser. No. 472,885

Claims priority, application France, May 25, 1973, 73.19024

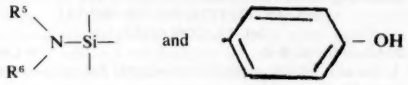
Int. Cl.[2] C08G 77/18

U.S. Cl. 260—46.5 R 10 Claims

1. A polysiloxane consisting essentially of recurrent units forming a macromolecular chain having the formula



where A is adamantyl, R_3 and R_4 each is alkyl, alkenyl or aryl, R_1 and R_2 each is hydrogen, alkyl or aryl, and x is 0 or a whole number, the chain having end groups of the formulas ,321 and



where R_5 and R_6 each is hydrogen, akyl, or aryl.

3,897,391

PROCESS FOR PREPARING POLYCARBONATE

Donald B. G. Jaquiss, New Harmony, and Howard E. Munro, Evansville, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 194,509, Nov. 1, 1971, abandoned. This application Sept. 28, 1973, Ser. No. 401,938

Int. Cl. C08g 17/13, 51/58

U.S. Cl. 260—47 XA 7 Claims

1. In a process for the manufacture of an improved aromatic polycarbonate by reacting a dihydric phenol with a carbonate precursor, the improvement comprising carrying out the reaction in the presence of 0.01 – 5.0 weight % of a hypophosphite selected from the group consisting of alkali earth metal hypophosphites and alkali metal hypophosphites; said weight % being based on the weight of the dihydric phenol employed in the reaction.

3,897,392

BRANCHED AROMATIC POLYCARBONATES

Heinrich Haupt; Dieter Freitag; Hugo Vernaleken, all of Krefeld; Kuno Wagner, Leverkusen-Steinbuechel, and Kurt Findeisen, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Germany

Filed Oct. 23, 1973, Ser. No. 408,981

Claims priority, application Germany, Nov. 9, 1972, 2254918

Int. Cl. C08g 17/13

U.S. Cl. 260—47 XA 9 Claims

1. Thermoplastic branched polycarbonates consisting essentially of the reaction products of aromatic dihydroxy compounds and ortho-aryl esters of carbonic acid or of monocarboxylic acids or dicarboxylic acids with polycarbonate precursors wherein the ortho-aryl esters are reacted in amounts of 0.01 to 5 mol percent relative to the amount of dihydroxy compound.

3,897,393

POLYIMIDES FROM BISMALEIMIDES AND HETEROCYCLIC DISECONDARY DIAMINES

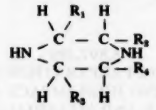
Robert T. Lu, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed Nov. 29, 1973, Ser. No. 419,994

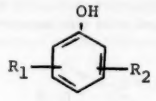
Int. Cl. C08g 20/32

U.S. Cl. 260—47 UA 10 Claims

1. In a process for the preparation of a polyimide polymer by reacting a bismaleimide with a difunctional heterocyclic disecondary amine characterized by the formula



wherein R_1, R_2, R_3, and R_4 are independently selected from the group consisting of hydrogen, halogen and alkyl groups containing from 1 to 4 carbon atoms, in the presence of a solvent for a sufficient time to form a polymer having recurring imide units in the polymer, wherein the reaction is carried out at a temperature from about 20°C. to about 120°C. and wherein the total concentration of bismaleimide and difunctional heterocyclic disecondary amine in the solvent is from about 1% to about 40% by weight and wherein the molar ratio of difunctional heterocyclic disecondary amine to bismaleimide is from 5 to 0.1, the improvement which comprises carrying out the polymerization reaction in the presence of at least one solvent characterized by the formula



wherein R_1 and R_2 are independently —H, halogen, or alkyl containing from 1 to 4 carbon atoms.

3,897,394

POLYBISPHENOLS

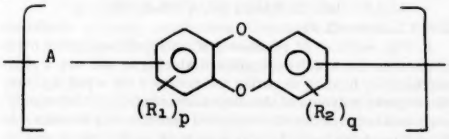
William Ross Moore, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 399,781, Sept. 21, 1973. This application July 1, 1974, Ser. No. 484,644

Int. Cl. C08g 23/00

U.S. Cl. 260—47 R 10 Claims

1. Polybisphenols having recurring units of the following structure,



wherein A is a divalent hydrocarbon group of 1–13 carbons, R_1 and R_2 are independently selected from hydrogen, halogen, alkoxy, or alkyl groups wherein the alkoxy or alkyl groups have 1–3 carbon atoms, p and q are 0 – 2 and the sum of p and q is 0 – 4, prepared by the oxidative coupling of bisphenols with an oxygen containing gas.

3,897,395

PROCESS FOR CHAIN-EXTENDING UNSATURATED TERMINATED POLYIMIDES AND PRODUCTS PREPARED THEREFROM

Gaetano Francis D'Alelio, South Bend, Ind., assignor to University of Notre Dame du Lac, Notre Dame, Ind.

Filed May 25, 1973, Ser. No. 363,801
Int. Cl. C08g 20/32
U.S. Cl. 260—63 N 13 Claims

1. A polymeric chain-extending process comprising heating a polyimide said polyimide of the formula:

wherein

Ar′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar′ radical,

Ar is a divalent aromatic organic radical,

R is a hydrocarbon radical of 1 to 12 carbon atoms, and

n is a positive integer of at least one.

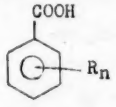
3,897,396

WITH SUBSTITUTED BENZOIC ACID CATALYSTS ACCELERATING THE CURE OF POLYURETHANEUREAS

Michio Ishii; Yoji Watabe, and Yutaka Iseda, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 30, 1974, Ser. No. 519,194
Int. Cl. C08g 22/34
U.S. Cl. 260—75 NB 16 Claims

1. A method of accelerating the cure rate of a polyurethaneurea reaction mixture, comprising forming a prepolymer by reacting an excess of an organic polyisocyanate with a hydroxyl containing compound having weight average molecular weight of 500 to 30,000 selected from the class consisting of polyether polyols, polyester polyols, and hydrocarbon polyols, mixing the resulting prepolymer with an organic polyamine curative, and an accelerating amount of a catalyst selected from the class consisting of alkyl and alkoxyl substituted benzoic acids shown by the formula



wherein R is selected from the class consisting of alkyl and alkoxyl having 1 to 4 carbon atoms, *n* is an integer of 1 to 3, and R may be similar or dissimilar when *n* is 2 or 3, and curing the polyurethaneurea reaction mixture.

3,897,397

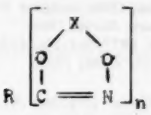
URETHANE COATING POWDER COMPOSITIONS

Donald H. Russell, Cherry Hill, N.J., and Kurt C. Frisch, Grosse Ile, Mich., assignors to Atlantic Richfield Company, Philadelphia, Pa.

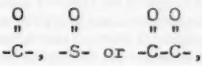
Filed Dec. 13, 1973, Ser. No. 424,487
Int. Cl.² C08G 18/00
U.S. Cl. 260—77.5 R 22 Claims

1. A shelf-stable coating powder composition having a particle size range such that most of the particles have a size of about 10 to 500 microns comprised of

A. 5 to 100 parts by weight of a cyclic nitrile compound having the structural formula



wherein X is



R is an organic radical free from reactive hydrogens as determined by the Zerewitinoff Test and *n* is at least 2,

B. 0 to 95 parts by weight of a reactive hydrogen-containing compound selected from the group consisting of organic polyols and organic polythiols, and mixtures of these,

C. 0 to 10 parts per 100 total parts of (A) and (B) of a condensation-rearrangement catalyst.

3,897,398

FIRE RESISTANT POLYMERS PRODUCED BY REACTING PHENYL ISOTHIOCYANATE AND TRIS (HYDROXYMETHYL) PHOSPHINE

John V. Beninate, Gretna; Donald J. Daigle, New Orleans; George L. Drake, Jr., Metairie; Wilson A. Reeves, Metairie, and Darrell J. Donaldson, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 141,352, May 7, 1971, Pat. No. 3,697,316.
This application May 31, 1972, Ser. No. 258,165
Int. Cl. C08g 22/16
U.S. Cl. 260—77.5 AQ 1 Claim

1. The polymers produced by mixing phenyl isocyanate and tris(hydroxymethyl)phosphine in solution with dimethylformamide in mole ratios of about from 1:3 to about 3:1 and polymerizing at temperatures about from 28° to about 155°C for periods ranging about from 24 hours to about 3 minutes, the longer periods of time being used in conjunction with the lower temperatures and the shorter periods of time with the higher temperatures.

3,897,399

POLYMERIC COMPOSITIONS

Geoffrey Phillip Newton, Luton, England, assignor to Laporte Industries Limited, London, England

Filed Jan. 29, 1973, Ser. No. 327,594
Claims priority, application United Kingdom, Feb. 8, 1972, 5782/72; Feb. 8, 1972, 5783/72; Mar. 11, 1972, 11514/72; Mar. 11, 1972, 11515/72
Int. Cl. ; C08g 22/12
U.S. Cl. 260—77.5 AN 12 Claims

1. A process for the production of a solid rigid non-foamed polyurethane of improved impact strength, heat distortion and flexural modulus properties which comprises:

a. reacting an ϵ-caprolactone with a triol or pentaerythritol to produce a liquid adduct or molecular weight of from 200 to 600 and a viscosity of less than 6000 centipoise at 25°C and

b. reacting the adduct with a liquid di-isocyanate in the absence of a blowing agent at elevated temperatures sufficient to provide said solid rigid non-foamed polyurethane of improved impact strength, heat distortion and flexural modulus properties.

3,897,400

POLYURETHANE CURED WITH AN AROMATIC MONOSULFIDE DIAMINE

Anthony F. Finelli, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 26, 1973, Ser. No. 427,773
Int. Cl.[2] C08G *18/38*
U.S. Cl. 260—77.5 AM 10 Claims

1. A cured polyurethane prepared by reacting 4,4'-diaminodiphenylsulfide with (A) a mixture of an organic polyisocyanate having an isocyanate functionality of 2 to 3 with a polymeric polyol having a hydroxyl functionality of 2 to 3 and a molecular weight in the range of about 500 to about 6000, where the ratio of isocyanato groups of said polyisocyanate to hydroxyl groups of said polymeric polyol is in the range of about 1.3/1 to about 5/1 or (B) the reaction product of said polyisocyanate and said polymeric polyol.

3,897,401

LIQUID POLYURETHANE REACTION MIXTURE

Harold R. Ringler, and David R. MacFarland, both of Logan, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 25, 1974, Ser. No. 454,048
Int. Cl.[2] C08G *18/24*
U.S. Cl. 260—77.5 AB 2 Claims

1. A liquid polyurethane reaction mixture characterized by a pot life of at least 30 minutes at 75°F. but less than 16 minutes at 150°F., consisting of a mixture of a reaction product of one mol of a 700 to 2,000 molecular weight polypropylene ether diol with 2.5 to 3.5 mols of 4,4'-methylene bis-(cyclohexyl isocyanate), sufficient curative to be equivalent to 90 to 99 mol percent of the excess isocyanate in the reaction product and 0.05 to 0.25 weight percent of a catalyst of di(alkyl)tin-S,S'-bis(alkyl mercapto alkylate) where the alkyl radical contains from one to 20 carbon atoms and the alkylate radical contains from one to 20 carbon atoms and the curative is butanediol-1,4 or a liquid mixture of trimethylol propane and butanediol-1,4 or polypropylene ether diol of 800 to 1,500 molecular weight.

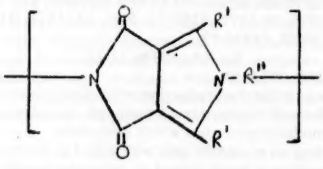
3,897,402

HIGH TEMPERATURE POLYIMIDES FROM 2,3-DIACYLSUCCINIC ACID DIESTER WITH DIAMINES

Robert W. Stackman, Morristown, N.J., and Donald W. Sargent, Schenectady, N.Y., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 143,674, May 12, 1971, abandoned. This application Aug. 24, 1973, Ser. No. 391,396
Int. Cl. C08g *20/04*, *20/20*
U.S. Cl. 260—78 A 9 Claims

1. A polyimide consisting esentially of recurring units of the formula:



wherein R' is H or an alkyl substituent of between about 1 and about 10 carbons; and R'' is an arylene substituent, biarylene substituent or diarylene substituent, and the inherent viscosity of said polyimide is between about 0.15 and about 3.0 as determined with solutions of 0.1 gram of polymer/100 milliliters 97% H_2SO_4 at 25°C.

3,897,403

METHOD OF PRODUCING SYNTHETIC CIS-1,4-POLYISOPRENE RUBBER HAVING HIGH GREEN STRENGTH

Junnosuke Yamauchi; Takayuki Okamura; Shobu Minatono, and Kazuhisa Yamauchi, all of Ibaragi, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Nov. 30, 1973, Ser. No. 420,632
Claims priority, application Japan, Dec. 2, 1972, 47-120960
Int. Cl. C08d *5/02*; C08f *27/00*
U.S. Cl. 260—78.4 D 11 Claims

1. A method of producing synthetic cis-1,4-polyisoprene rubber having an improved green strength, which comprises reacting synthetic cis-1,4-polyisoprene with maleic anhydride in, as an inert reaction medium, an aromatic hydrocarbon solvent or a saturated aliphatic hydrocarbon solvent for said polyisoprene in the presence of isoprene monomer in an amount of at least 10 moles per mole of maleic anhydride and also in thet presence of a free radical initiator in an amount which is both from 0.02 to 10 moles per mole of maleic anhydride and from 0.1 to 15 millimoles per 100 g of said polyisoprene rubber.

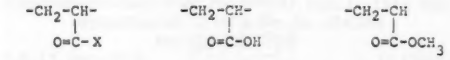
3,897,404

PROCESS FOR THE PRODUCTION OF COPOLYMERS CONTAINING ACRYLIC ACID AMIDES

Siegfried Korte, Leverkusen; Carlhans Süling, Odenthal-Hahnenberg, and Günter Lorenz, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

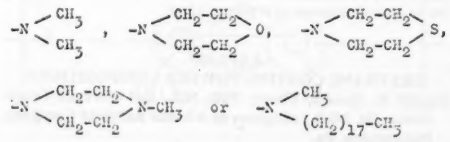
Filed Apr. 11, 1973, Ser. No. 349,970
Claims priority, application Germany, Apr. 11, 1972, 2217334; Feb. 1, 1973, 2304891
Int. Cl. C08f *15/40*, *27/06*, *27/08*
U.S. Cl. 260—79.5 NV 4 Claims

1. A process for the production of water-soluble copolymers consisting essentially of recurring structural units corresponding to the formulae (*a*), (*b*), and (*c*)



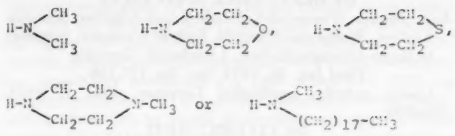
a) b) c)

wherein X is



by reacting polyacrylic acid methyl ester with an amine of the formula

the formula



in an aprotic solvent consisting essentially of dimethyl formamide, dimethylacetamide, tetramethyl urea, N,N-dimethyl methoxy-acetamide, N,N-dimethyl cyanamide, N,N-dimethyl cyanacetamide, hexamethyl phosphoric acid triamide, N-methyl pyrrolidone, N-formyl pyrrolidone or N-formyl morpholine; at a temperature from 160°C to 210°C under a pressure of 0 to 100 atm; for a period of time and under conditions to form a copolymer having an average chemical composition of

15 to 97 mol % of acrylic acid amide	(*a*)
2.5 to 55 mol % of acrylic acid	(*b*)
0.5 to 30 mol % of acrylic acid methyl ester	(*c*)

in which the molar ratio of acrylic acid to acrylic acid methyl ester amounts to between 1:12 and 110:1.

3,897,405

EPDM POLYMERS GRAFTED WITH VULCANIZATION ACCELERATORS

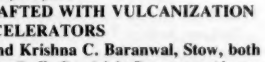
Pyong-Nae Son, Akron, and Krishna C. Baranwal, Stow, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 320,543, Jan. 2, 1973, Pat. No. 3,821,134. This application Feb. 13, 1974, Ser. No. 442,109

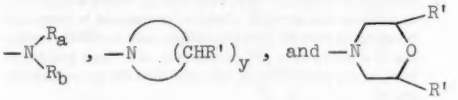
Int. Cl. C08c *9/08;* **C08d** *9/04;* **C08f** *29/12*

U.S. Cl. 260—79.5 NV **6 Claims**

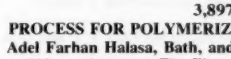
1. An ethylene-higher α-olefin-polyene polymer having grafted thereon about 0.1 part to about 10 parts by weight per 100 parts by weight of the polymer a vulcanization accelerator selected from the group consisting of (1) thiuram sulfides of the formula



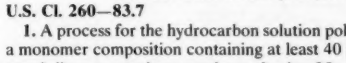
wherein *x* is 1 to about 6, and A and B are selected from the group consisting of



where R_a and R_b are hydrogen, alkyl radicals containing 1 to 24 carbon atoms, an aryl, alkaryl, or aralkyl radical containing 6 to 18 carbon atoms, or a cycloalkyl radical containing 3 to 8 carbon atoms in the ring, and R′ is hydrogen or an alkyl radical containing 1 to 4 carbon atoms, and *y* is 2 to 7, (2) sulfenamides of the formula R″—S_x—A where *x* and A are defined as above, and R″ is selected from the group consisting of an alkyl radical containing 1 to 18 carbon atoms, an aryl, alkaryl, aralkyl radical containing 6 to 18 carbon atoms, a cycloalkyl radical containing 3 to 8 carbon atoms in the ring, a heterocyclic radical containing 3 to 8 atoms in the ring selected from carbon, oxygen, nitrogen, and sulfur wherein at least two atoms are carbon, and a thiazole ring, (3) thiocarbamyl sulfenamides of the formula



wherein A and B are defined as above, (4) xanthogen disulfide of the formula



where R‴ is an alkyl radical containing 3 to 6 carbon atoms, (5) sulfide compounds selected from the group consisting of 2,2′-benzothiazyl disulfide, 2-(2,4-dinitrophenylthio)benzothiazole, 2-benzothiazyl-N,N-diethylenethiocarbamyl sulfide, 2-benzothiazyl-4-morpholinyl disulfide, 4,4′-dithiodimorpholine, and 4,4′-dithiodipiperidine, and (6) azole compounds containing a SH group selected from the group consisting of 2-mercaptobenzothiazole, N,N-diisopropyl-2-mercaptobenzothiazole sulfenamide, N,N-diethylthiocarbamyl-2-mercaptobenzothiazole, 2-mercaptobenzothiazoline, 2-mercaptobenzoimidazoline, 2-mercaptothiazoline, and 2-mercaptoimidazoline.

3,897,406

PROCESS FOR POLYMERIZING CONJUGATED DIENES

Adel Farhan Halasa, Bath, and Adolph Para, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Dec. 10, 1973, Ser. No. 423,379

Int. Cl.[2] C08F *236/10, 136/06*

U.S. Cl. 260—83.7 **14 Claims**

1. A process for the hydrocarbon solution polymerization of a monomer composition containing at least 40 percent conjugated diene to produce a polymer having 25 – 45 percent of the diene in the 1,2 configuration and the remainder being predominantly of the trans-1,4 configuration and a molecular weight of about 5,000 to 500,000 comprising the steps of maintaining said monomer composition at a temperature of 30°–200° C. in intimate contact with a catalyst composition consisting essentially of:

a. a sodium allyl compound having 3–10 carbon atoms;

b. a sodium alkoxide of no more than 10 carbon atoms, and

c. an alkyl-aryl ether in which said alkyl group has 1–8 carbon atoms and said aryl group is phenyl, tolyl, xylyl or naphthyl; the concentration of said catalyst composition being 0.1–4 millimoles of catalyst per 100 grams of said monomer composition, said sodium alkoxide being present in said catalyst composition in a proportion of 0.5–2.5 moles per mole of sodium allyl compound, said ether being present in a proportion of 1–10 grams per 100 grams of monomer composition, said polymerization being conducted for a period of at least one hour, and said monomer composition consisting essentially of 40–100 percent by weight of said conjugated diene and 0–60 percent by weight of an aromatic monomer having no more than 20 carbon atoms selected from the class consisting of vinyl and isopropenyl aryl compounds and derivatives thereof in which the derivative group is an alkyl, aralkyl, cycloalkyl or chlorine attached directly to the aromatic nucleus thereof.

3,897,407
PROCESS FOR PRODUCING CRYSTALLINE PROPYLENE POLYMER

Isoo Shirai; Takeshi Suzuki, and Koichi Tonooka, all of Ichiharashi, Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 160,281, July 7, 1971, abandoned. This application May 14, 1973, Ser. No. 359,839
Claims priority, application Japan, July 14, 1970, 45-61667
Int. Cl. C08f *1/42, 3/10;* **B01j** *11/84*
U.S. Cl. 260—88.2 R **5 Claims**

1. A process for producing crystalline propylene polymers which comprises contacting propylene or a mixture of propylene and another α-olefin, with a catalyst comprising

1. a size-controlled and heat-treated $TiCl_3.0.33AlCl_3$ and
2. a dialkylaluminum monohalide having the general formula of AlR_2X (wherein R is a hydrocarbon radical and X is a halogen atom) or a combination of an alkylaluminum dihalide having a general formula of $AlR'X_2$ (wherein R' is a hydrocarbon radical and X is a halogen atom) and $Si(OC_2H_5)_4$,
3. said size-controlled and heat-treated $TiCl_3.0.33AlCl_3$ being prepared by reacting $TiCl_4$ with Al powders in a mol ratio of $TiCl_4$ to Al greater than 3:1, removing unreacted $TiCl_4$, size-controlling the resulting powders of $TiCl_3.0.33AlCl_3$ by ball-milling in a revolving or vibrating ball-mill containing the same or substantially the same size of steel or stainless steel balls having a diameter of 25 – 50 mm, at room temperature, to give size-controlled powders consisting of 50% or more of the particles of 325 meshes on and less than 50% of the particles of 325 meshes pass, and heat-treating the size-controlled powders:

a. at a temperature (T) which satisfies the conditions 100°C $\leqq$ T $\leqq$ 250°C.,
b. at a pressure (P) which satisfies the conditions 0.01 mmHg $\leqq$ P $\leqq$ 760 mmHg,
c. for a time (Q) which satisfies the condition 1 minute $\leqq$ Q $\leqq$ 300 minutes,

and wherein the following relationship between T, P and Q is maintained:

d. $9.52 \times 10^{-3}T - 6.26 \times 10^{-5}P + 3.98 \times 10^{-4}Q \geqq 1$ and
e. $3.53 \times 10^{-3}T + 2.94 \times 10^{-4}P + 3.54 \times 10^{-4}Q \leqq 1$.

3,897,408
POLYMERISATION PROCESS

Alan Charles Sturt, Guildford, England, assignor to BP Chemicals International Limited, London, England

Filed Oct. 26, 1973, Ser. No. 409,794
Claims priority, application United Kingdom, Nov. 8, 1972, 51434/72
Int. Cl. C08f *3/30*
U.S. Cl. 260—92.8 W **11 Claims**

1. A process which comprises carrying out the following steps (a), (b), (c) and (d) in any order with agitation on a vinyl halide polymer latex:

a. contacting the latex polymer with vinyl halide monomer,
b. inactivating the emulsifying agent of the latex,
c. adding a suspension stabiliser system, and
d. adding a non-polymeric modifier,

and then subsequently removing the monomer.

3,897,409
FREEZE CONCENTRATION OF AQUEOUS SOLUTIONS OF HEAT-LABILE SUBSTANCES

Fritz Hüper, Wuppertal-Vohwinkel, and Günther Schmidt-Kastner, Wuppertal-Elberfeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 26, 1973, Ser. No. 327,108
Claims priority, application Germany, Feb. 1, 1972, 2204598
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 **13 Claims**

1. A process for the freeze concentration of a crude aqueous solution of a heat-labile substance which includes the steps of cooling a crude aqueous solution of a heat-labile substance to produce a frozen crude solution and a pre-cooled solution of said heat-labile substance, mixing said frozen crude solution and said pre-cooled solution with ice, to produce pure ice crystals and a first concentrated solution of said heat-labile substance and separating said pure ice crystals from said first concentrated solution of said heat-labile substance said heat-labile substance being capable of decomposing, at a temperature of 55°C in 1 hour to an extent of at least 10% loss by weight.

3,897,410
RAPID SETTING NON-ELASTOMERIC POLYURETHANE COMPOSITIONS PREPARED IN THE PRESENCE OF A MIXTURE OF LIQUID MODIFIERS

Franciszek Olstowski, Freeport, and Donald B. Parrish, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 366,835, June 4, 1973, which is a continuation-in-part of Ser. No. 179,149, Sept. 9, 1971, abandoned. This application Dec. 17, 1973, Ser. No. 425,411
Int. Cl. G08g *18/48*
U.S. Cl. 260—18 TN **17 Claims**

1. A non-elastomeric, non-cellular solid polymer having a density of at least about 1 gram/cc and percent elongation of less than 80 resulting from admixture of the components of a composition comprising:

A. a polyether polyol having from 3 to about 8 hydroxyl groups and a hydroxyl equivalent weight between 75 and about 230;
B. an organic polyisocyanate;
C. a liquid modifier compound having an atmospheric boiling point of at least about 150°C, with the proviso that a hydroxyl-containing halogenated alphatic compound when employed as a modifier can have an atmospheric boiling point below 150°C, and which moderates the reaction between compounds (A), (B), and (D) without substantial reaction therewith, except when a hydroxyl-containing halogenated aliphatic compound is employed it can react with the polyisocyanate, said modifier consisting of a mixture, in any proportion, of at least two members, in any combination, selected from the group consisting of

1. a fatty acid or fatty oils,
2. organic phosphates, phosphites, or phosphonates,
3. cyclic polyethers,
4. aromatic compounds free from ester groups or partially hydrogenated aromatic compounds free from ester groups,
5. halogenated aliphatic compounds,
6. cyclic sulfones,
7. organic carbonates,
8. esters of carboxylic acids
9. hydroxyl-containing polyoxyalkylene compounds having an average molecular weight of at least about 700 and
10. non-hydroxyl-containing polyoxyalkylene compounds, and

D. a non-amine containing catalyst for urethane formation, which is an organo metal compound;

wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 2:1; the quantity of component (C) is from about 20 to about 50 with the proviso that when compound (B) is an NCO-containing prepolymer containing less than about 40% NCO by weight, component (C) is present in quantities of from about 10% to about 50% by weight of the combined weight of components (A), (B) and (C) with the proviso that when component (C) contains at least 0.2% of component (C-5) based on the sum of the weights of components (A), (B) and (C), the quantity of one or more of the other compounds of component (C) is between 0 and about 50% minus the quantity of component (C-5), with a further proviso that whenever component (C) contains a hydroxylcontaining halogenated aliphatic compound which either has a boiling point below about 150°C or an OH equivalent weight below about 00, then the quantity of such compound or compounds is not to exceed about 10% and preferably not more than about 5% by weight of the combined weight of components (B), (B) and (C); and component (D) is present in quantities of from about 0.2 to about 10.0 percent by weight of the combined weight of components (A), (B) and (C); and wherein said polymer can be demolded within less than 5 minutes, without the application of an external source of heat, after admixture of said composition.

3,897,411

MONOAZO PIGMENTS CONTAINING A PHENYLAMINO-QUINAZOLINE RADICAL

Rudolf Mory, Dornach, and Rolf Muller, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

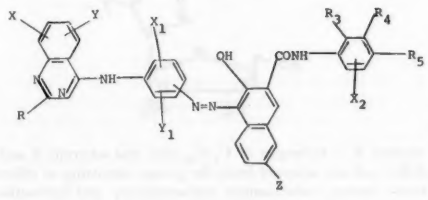
Filed Aug. 3, 1973, Ser. No. 385,617

Claims priority, application Switzerland, Aug. 17, 1972, 12197/72

Int. Cl. C09b *29/32, 29/36;* **D06p** *1/04*

U.S. Cl. 260—154 **8 Claims**

1. A monoazo pigment of the formula



wherein R is hydrogen, lower alkyl or phenyl, X and Y are hydrogen, chloro, lower alkyl, lower alkoxy, X_1 and Y_1 are hydrogen, chloro, lower alkyl, lower alkoxy, lower alkoxy carbonyl, trifluoromethyl or cyano, R_3 and R_4 or R_4 and R_5 together form a heterocyclic ring of the formula

(VI)

wherein R_6 and R_7 is hydrogen or lower alkyl, X_2 is hydrogen, chloro, lower alkyl, lower alkoxy or nitro, and Z is hydrogen, chloro, methoxy or cyano.

3,897,412

PAROMOMYCIN ANTIBIOTIC DERIVATIVES

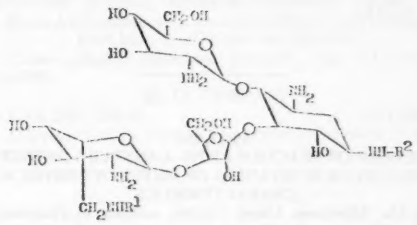
Takayuki Naito, and Susumu Nakagawa, both of Tokyo, Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 250,389, May 4, 1972, abandoned. This application June 15, 1973, Ser. No. 370,280

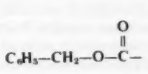
Int. Cl.[2] C07H *15/20*

U.S. Cl. 260—210 AB **6 Claims**

1. A compound having the formula



in which R^1 is H or



and R^2 is H, L-(−)-β-amino-α-hydroxypropionyl, L-(−)-δ-amino-α-hydroxyvaleryl, L-(−)-β-benzyloxycarbonylamino-α-hydroxypropionyl, or L-(−)-δ-benzyloxycarbonylamino-α-

hydroxyvaleryl, wherein R^1 or R^2 must be other than H; or a nontoxic pharmaceutically acceptable acid addition salt thereof.

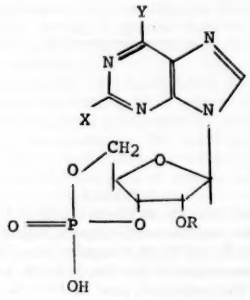
3,897,413

2,6-DISUBSTITUTED PURINE CYCLIC NUCLEOTIDES

Dennis A. Shuman, Mission Viejo; Rich B. Meyer, Jr., Laguna Beach, and Roland K. Robins, Santa Ana, all of Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

Filed Nov. 22, 1971, Ser. No. 201,157
Int. Cl. C07d *51/54*
U.S. Cl. 260—211.5 R **6 Claims**

1. A compound of structure:



wherein R is hydrogen or C_1–C_{18} acyl, Y is Cl or Br, and X is Cl, F or Br.

3,897,414

METHOD OF FRACTIONATING A MIXTURE OF HIGH MOLECULAR SUBSTANCES OF DIFFERENT PHYSICAL CHARACTERISTICS

Per-Åke Albertsson, Umea, Sweden, assignor to Pharmacia Fine Chemicals AB, Uppsala, Sweden

Continuation-in-part of Ser. No. 857,854, Sept. 15, 1969, abandoned. This application Nov. 3, 1972, Ser. No. 303,439
Claims priority, application Japan, Sept. 12, 1969, 44-72066
Int. Cl. C07d *51/50*
U.S. Cl. 260—211.5 R **6 Claims**

1. In the known method for fractionating a mixture of high molecular substance selected from the group consisting of cell particles and macromolecules of different physical characteristics by contacting said mixture with two immiscible aqueous liquids, the improvement which comprises

a. providing a plurality of vertically arranged fractionating zones that includes two end fractionating zones (consisting of a top fractionating zone and a bottom fractionating zone) and at least one intermediate fractionating zone,
b. each of said fractionating zones being in communication with the next adjacent fractionating zone by virtue of a liquid-permeable, fine pore plate,
c. filling all of the fractionating zones of said column with two immiscible aqueous liquids,
d. agitating the thus introduced two immiscible aqueous liquids contained within the fractionating zones of said column,
e. discontinuing the agitation set forth in step (d) and allowing the two immiscible aqueous liquids that are present in each fractionating zone to separate into a top phase liquid and a bottom phase liquid,
f. introducing into one of the fractionating zones a mixture of high molecular weight substances selected from the group consisting of cell particles and macromolecules that have been dissolved or dispersed in one of the aforementioned two phase liquids,
g. agitating the phases in each fractionating zone,
h. thereafter allowing the phases in each fractionation zone to again separate into a top phase liquid and a bottom phase liquid,
i. introducing into one of the end fractionating zones a quantity of one of the two phase liquids large enough to cause at least some corresponding phase liquid that is already present in each fractionating zone to be displaced into the next adjacent fractionating zone, but not large enough to cause the other of said two phase liquids present in each fractionating zone to be displaced to the same next adjacent fractionating zone, and collecting from the other of said end fractionating zones approximately the same quantity of phase liquid that was introduced,
j. agitating the phases in each fractionating zone,
k. thereafter allowing the phases in each fractionation zone to separate into a top phase liquid and a bottom phase liquid,
l. repeating the sequence of steps (i) through (k) until the desired separation is reached and
m. collecting at least one fraction of separated components from the other of said end fractionating zones.

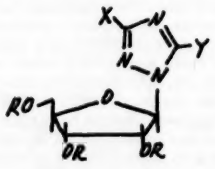
3,897,415

5-SUBSTITUTED 1,2,4-TRIAZOLE-3-CARBOXAMIDO NUCLEOSIDES AND ANALOGS THEREOF

Roland K. Robins, Santa Ana, and Joseph T. Witkowski, Laguna Niguel, both of Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 240,252, March 31, 1972, Pat. No. 3,798,209, which is a continuation-in-part of Ser. No. 149,017, June 1, 1971, abandoned. This application Sept. 28, 1972, Ser. No. 292,929
Int. Cl. C07d *51/50*
U.S. Cl. 260—211.5 R **10 Claims**

1. A compound of structure



wherein R is hydrogen or C_1–C_{18} acyl and wherein X and Y differ and are selected from the group consisting of chloro-, iodo-, bromo, carboxamide, carbomethoxy, and carboethoxy groups.

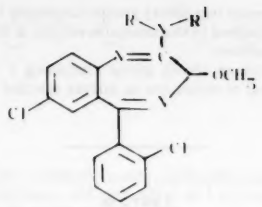
3,897,416

SYNTHESIS OF 2-AMINO-5-ARYL-3H-1,4-BENZODIAZEPINES

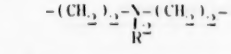
John H. Sellstedt, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Nov. 28, 1972, Ser. No. 310,052
Int. Cl. C07d *53/06*
U.S. Cl. 260—239 BD **4 Claims**

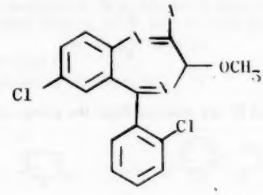
1. A process for preparing a compound of the formula:



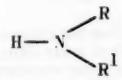
wherin R and R^1 may be the same or different and are chosen from the group consisting of hydrogen, alkyl of from 1 to 6 carbon atoms, and when taken together are $-(CH_2)_n-$ wherein n is from 3 to 7, $-(CH_2)_2-O-(CH_2)_2-$, and



wherein R^2 is alkyl of from 1 to 6 carbon atoms; comprising reacting a compound of the formula:



wherein A is chlorine, $PO(OMe)_2$, or $PO(OEt)_2$ with an amine of the formula:



wherein R and R^1 are as defined above.

3,897,417

PROCESS FOR THE PREPARATION OF STEROIDAL SPIROLACTONES AND INTERMEDIATES

Julien Warnant, Neuilly-sur-Seine, and Jean Jolly, Fontenay-sous-Bois, both of France, assignors to Roussel Uclaf, Paris, France

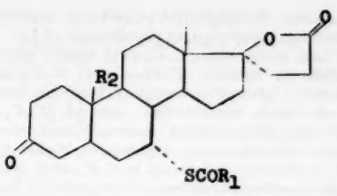
Filed Feb. 1, 1974, Ser. No. 438,601

Claims priority, application France, Feb. 6, 1973, 73.04057

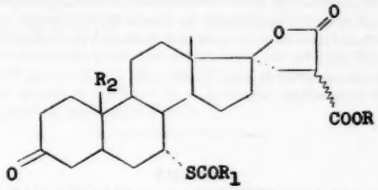
Int. Cl.[2] C07C *173/00*

U.S. Cl. 260—239.57 **12 Claims**

1. A process for the production of a steroidal spirolactone having the formula



wherein R_1 is a linear alkyl having from 1 to 4 carbon atoms and R_2 is a member selected from the group consisting of hydrogen and methyl comprising the steps of heating a compound having the formula



wherein R is an alkyl having 1 to 4 carbon atoms and R_1 and R_2 have the above meanings, to a temperature of from 80°C to 160°C in a neutral media and in the presence of water, and recovering said steroidal spirolactone.

3,897,418

BASIC DYESTUFFS

Hans-Peter Kuhlthau, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

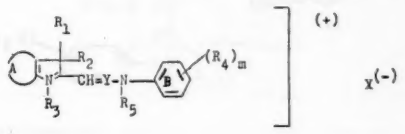
Filed Mar. 9, 1973, Ser. No. 339,889

Claims priority, application Germany, Mar. 11, 1972, 2211958

Int. Cl. C09b *23/00*

U.S. Cl. 260—240 G **14 Claims**

1. Dyestuff of the formula or mixtures of dyestuffs of the formula



wherein

A is a dibenzofuranyl radical;

R_1 and R_2 are C_1-C_6-alkyl fluoro-C_1-C_6-alkyl, chloro-C_1-C_6-alkyl, bromo-C_1-C_6-alkyl, hydroxy-C_1-C_6-alkyl, methoxy-C_1-C_6-alkyl, cyano-C_1-C_6-alkyl, acetoxy-C_1-C_6-alkyl, or aminocarbonyl-C_1-C_6-alkyl, C_2-C_6-alkenyl, chloro-C_2-C_6-alkenyl, phenylmethyl-C_2-C_6-alkenyl, phenylethyl-C_2-C_6-alkenyl, phenylpropyl-(2,2)-C_2-C_6-alkenyl, cyclohexyl-C_2-C_6-alkenyl; or, when R_1 and R_2 are joined together, cyclohexyl;

R_3 is hydrogen, C_1-C_6-alkyl fluoro-C_1-C_6-alkyl, chloro-C_1-C_6-alkyl, bromo-C_1-C_6-alkyl, hydroxy-C_1-C_6-alkyl, methoxy-C_1-C_6-alkyl, cyano-C_1-C_6-alkyl acetoxy-C_1-C_6-alkyl, or aminocarbonyl-C_1-C_6-alkyl, C_2-C_6-alkenyl, chloro-C_2-C_6-alkenyl, phenyl-C_2-C_6-alkenyl, chlorophenyl-C_2-

C_6-alkenyl, methylphenyl-C_2-C_6-alkenyl, naphthyl, phenylmethyl, phenylethyl, or phenylpropyl-(2,2);

R_4 is halo, cyano, nitro, C_1-C_4-alkyl, benzyl, phenylethyl, cyclohexyl, hydroxy, C_1-C_{12}-alkoxy, C_1-C_{12}-alkylthio, phenyloxy, phenylthio, benzyloxy, benzythio, amino, C_1-C_4-alkylamino, benzoylamino, carboxyl, (C_1-C_4-alkoxy) carbonyl, aminocarbonyl, aminosulphonyl, methylbenzyloxy, chlorobenzyloxy, naphthyloxy, N-phenylcarbamoyl, or phenyloxy substituted by C_1-C_4-alkyl, cyclohexyl, methoxy, ethoxy, acetylamino, hydroxy, nitro, or chloro, or additionally when joined to ring B naphthalene;

R_5 is hydrogen, C_1-C_6-alkyl fluoro-C_1-C_6-alkyl, chloro-C_1-C_6-alkyl, bromo-C_1-C_6-alkyl, hydroxy-C_1-C_6-alkenyl, methoxy-C_1-C_6-alkyl, cyano-C_1-C_6-alkyl, acetoxy-C_1-C_6-alkyl, aminocarbonyl-C_1-C_6-alkyl, C_2-C_6-alkenyl, chloro-C_2-C_6-alkenyl, cyclohexyl, phenylmethyl, phenylethyl, phenylpropyl-(2,2), or additionally when joined to ring B, dihydroindolyl, hexahydrocarbazolyl, tetrahydroquinolinyl, tetrahydroquinoxalinyl, dihydrobenzoxazinyl, or any of said heterocyclic radicals substituted by methyl;

Y is CH or N;

m is the number 0, 1 or 2; and

$X^{(-)}$ is an anion.

3,897,419

BASICALLY SUBSTITUTED COUMARIN DERIVATIVES

Heinz Bender, Bergen-Enkheim, Germany; Adolf Stachel, deceased, late of Frankfurt-Fechenheim, Germany; by Ingeburg Lydia Katharina Stachel, heiress, Offenbach, Germany; Rudi Beyerle, Bruchkobel, Germany; Rolf-Eberhard Nitz, Bergen-Enkheim, Germany, and Josef Scholtholt, Frankfurt, Germany, assignors to Cassella Farbwerke Mainkur AG, Frankfurt am Main-Fechenheim, Germany

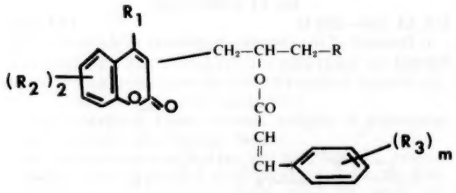
Filed Sept. 13, 1973, Ser. No. 397,145

Claims priority, application Germany, Sept. 28, 1972, 2247691

Int. Cl.[2] C07D *311/12*

U.S. Cl. 260—240 J **4 Claims**

1. Basically substituted coumarin derivatives having the formula



and pharmaceutically acceptable acid addition salts thereof wherein

R represents a radical derived from the group consisting of an alkylamine, dialkylamine, alkenylamine, alkylenediamine, hydroxyalkylamine, alkoxyalkylamine, acyloxyalkylamine, alkyl- cycloalkylamine, alkylphenalkylamine alkyl-alkoxyphenalkylamine, alkyl-alkoxyphenylamine, alkylphenylamine having 2 – 10 carbon atoms, pyrrolidine, morpholine, thiomorpholine, piperidine, N-methylpiperazine, N-(β-hydroxyethyl)-piperazine, N-(γ-hydroxypropyl)-piperazine, N-(p-chloro-phenyl)-piperazine, N-(2,3,4-trimethoxy-benzyl)-piperazine, N-(3,4-dimethoxy-benzyl)piperazine, N-(2,6-dimethylphenyl-carbamoylmethyl)-piperazine, N-(3,4,5-trimethoxy-phenyl-carbamoylmethyl)-piperazine and hexamethyleneimine, the radical being attached through the nitrogen atom,

R_1 represents an alkyl radical having 1 – 4 carbon atoms, or an aryl radical,

$(R_2)_2$ represents two alkoxy groups containing 1 – 4 carbon atoms, attached to the coumarin residue in the 5,7-, 6,7- or 7,8-positions,

R_3 represents an alkoxy group containing 1 – 4 carbon atoms, and m represents an integer selected from 2 and 3.

3,897,420

2-AMINOALKYL-7-SUBSTITUTED-3,3A,4,5,6,7-HEXAHYDRO-3-SUBSTITUTED-2H-PYRAZOLO[4,3-C]PYRIDINES

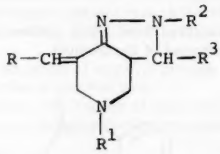
John Krapcho, Somerset, and Chester F. Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 374,722, June 28, 1973, abandoned. This application June 17, 1974, Ser. No. 479,921

Int. Cl. C09b *23/00*, *23/04*

U.S. Cl. 260—240 F **6 Claims**

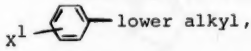
1. A compound of the formula



wherein R and R^3 are selected from the group consisting of

and

X and X^1 are selected from the group consisting of hydrogen, chloro, fluoro, lower alkyl, lower alkoxy and trifluoromethyl; R^1 is selected from the group consisting of hydrogen, lower alkyl,



hydroxy lower alkyl and lower alkanoyl; R^2 is B- lower alkyl wherein B is di-lower alkylamino, lower alkyl amino, piperidino, pyrrolidino, morpholine, N-lower alkyl piperazino and N-(2-hydroxyethyl)piperazino; and N-oxides and acid-addition salts thereof.

3,897,421

ORGANIC COMPOUNDS

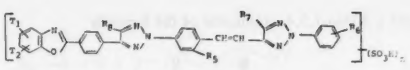
Horst Aebli, Basel; Fritz Fleck, Bottmingen, Basel-Land, and Horst Schmid, Munchenstein, Basel-Land, all of Switzerland, assignors to Sandoz Ltd., Basle, Switzerland

Continuation-in-part of Ser. No. 255,256, May 22, 1972, abandoned. This application Dec. 3, 1973, Ser. No. 420,987

Int. Cl. C07d *85/98*; C09b *23/14*

U.S. Cl. 260—240.1 **8 Claims**

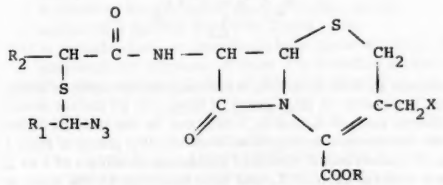
1. A compound of formula



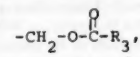
in which
R_5 is sulpho, sulphonic amide, carboxylic amide or cyano,
R_6 is hydrogen, chlorine, alkyl of 1 to 4 carbon atoms, carboxylic amide or cyano,
R_7 is hydrogen, chlorine, methyl, hydroxymethyl, chloromethyl or acetoxymethyl,
R_8 is hydrogen, chlorine or methyl,
n is 0 or a whole number, and
either T_1 is hydrogen, chlorine, phenyl, alkyl of 1 to 8 carbon atoms, alkoxy of 1 to 4 carbon atoms, or cyano
and T_2 signifies hydrogen,
or T_1 and R_2 both signify cyano.

3,897,422
[(AZIDOMETHYL)THIO]ACETYLCEPHALOSPORINS
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc.
Filed Mar. 5, 1973, Ser. No. 337,804
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C **9 Claims**

1. A compound of the formula



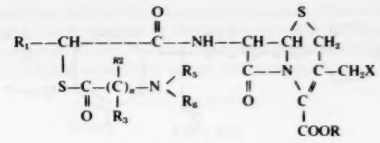
wherein R is hydrogen, tri(lower alkyl)silyl,



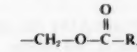
alkali metal, alkaline earth metal or lower alkylamine; R_1 is hydrogen or lower alkyl; R_2 is hydrogen, lower alkyl, phenyl, thienyl, furyl or pyridyl; R_3 is lower alkyl, phenyl or phenyl-lower alkyl; and X is hydrogen, hydroxy, lower alkanoyloxy, lower alkoxy or lower alkylthio.

3,897,423
AMINO SUBSTITUTED ACYLTHIO CEPHALOSPORINS
Uwe D. Treuner; Hermann Breuer, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J. Squibb & Sons, Inc., Princeton, N.J.
Filed Mar. 5, 1973, Ser. No. 337,806
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C **9 Claims**

1. A compound of the formula



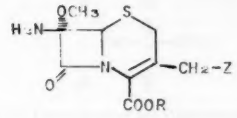
wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, tri(lower alkyl)silyl, tri(lower alkyl)stannyl,



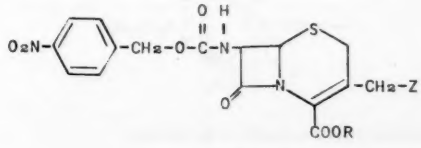
or a salt forming ion selected from the group consisting of alkali metal, alkaline earth metal, lower alkylamine, phenyl-lower alkylamine or lower alkylpiperidine; R_1 is phenyl or R_7-phenyl; R_2 and R_3 each is hydrogen, lower alkyl or phenyl; R_4 is lower alkyl, phenyl or phenyl-lower alkyl; R_5 and R_6 each is hydrogen or lower alkyl; R_7 is halo, hydroxy, lower alkyl, lower alkoxy or carboxy; X is hydrogen, hydroxy or lower alkanoyloxy; and n is 1, 2 or 3.

3,897,424
PROCESS FOR
7-β-AMINO-7-α-METHOXY-CEPHALOSPORANIC ACID ESTERS AND RELATED COMPOUNDS
Gary A. Koppel, and William H. W. Lunn, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Filed July 23, 1973, Ser. No. 381,470
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C **7 Claims**

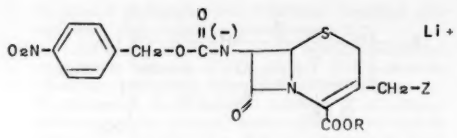
1. The method for preparing a 7β-amino-7α-methoxy-3-cephem ester of the formula



which comprises
a. reacting a 7β-(p-nitrobenzyloxycarbamido)-3-cephem ester of the formula

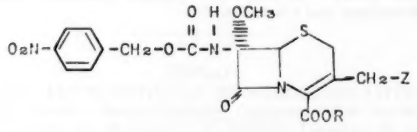


in the presence of excess methanol in an inert, anhydrous solvent at a temperature between −120° and −25°C. with methyl lithium in an amount corresponding to between 2 and 6 moles per mole of cephem ester, to form in said reaction mixture, the anionic form of the cephem ester of the formula



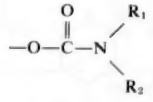
b. adding to said reaction mixture between 1 and 5 moles of t-butyl hypochlorite per mole of cephem ester;

c. acidifying said reaction mixture and recovering a 7β-(p-nitrobenzyloxycarbamido)-7α-methoxy-3-cephem ester of the formula



d. reacting said methoxy 3-cephem ester in an inert solvent with a reducing agent selected from the group consisting of hydrogen in the presence of a palladium catalyst and an alkali or alkaline metal salt of dithionic acid at a pH between about pH 7 and pH 8, and recovering from said reduction mixture the methoxy 3-cephem ester reduction product;

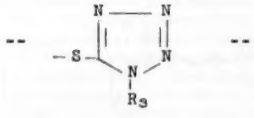
e. acidifying said methoxy 3-cephem reduction product in an acidic medium selected from the group consisting of an aqueous medium at a pH of between about pH 4 and pH 6 and an inert liquid medium containing in suspension silica gel, and recovering the 7β-amino-7α-methoxy-3-cephem ester from said acidic medium; where in the above formulae Z ie hydrogen C_2–C_4 alkanoyloxy, C_1–C_4 alkoxy, C_1–C_4 alkylthio, a carbamoyloxy group of the formula



wherein

R_1 and R_2 independently are hydrogen or C_1–C_4 lower alkyl, or

Z is a five-membered heterocyclic thio group selected from the group consisting of a 5-thiotetrazole of the formula



a 2-thio-1,3,4-thiadiazole of the formula

and a 2-thio-1,3,4-oxadiazole of the formula

wherein

R_3 is hydrogen, C_1–C_4 alkyl or phenyl;

and

R is benzyl, p-nitrobenzyl, p-methoxybenzyl, diphenylmethyl or 2,2,2-trichloroethyl.

3,897,425

3-CHLORO-TETRAHYDRO-1,3-OXAZINES OR OXAZOLIDINES

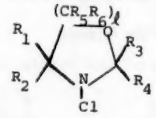
Nicolae S. Bodor, and James J. Kaminski, both of Lawrence, Kans., assignors to Interx Research Corporation, Lawrence, Kans.

Filed Apr. 1, 1974, Ser. No. 456,744

Int. Cl.[2] C07D *265/06*

U.S. Cl. 260—244 R **11 Claims**

1. A 3-Chloro-tetrahydro-1,3-oxazine or oxazolidine compound of the formula:



wherein each of R_1 and R_2, which may be the same or different, represents an alkyl group of from 1 to 20 carbon atoms; wherein each of R_5 and R_6, which may be the same or different, represents a hydrogen atom or an alkyl group of from 1 to 20 carbon atoms; wherein *l* represents an integer of 1 or 2; and wherein each of R_3 and R_4, which may be the same or different, represents an alkyl group of from 1 to 20 carbon atoms, a $-(CH_2)_nX$ group, wherein *n* represents an integer of from 1 to 20 and wherein X represents a member selected from the group consisting of a dimethylamino group, a diethylamino group, a trimethylammonium group, a triethylammonium group, a dimethylammonium group, a diethylammonium group, a $-COOR_7$ group, a $-OOCR_8$ group, and a $-OR_9$ group, wherein each of R_7 through R_9, respectively, represents a member selected from the group consisting of an alkyl group of from 1 to 5 carbon atoms or a benzyl group.

3,897,426

1-(3-(AMINO ALKYL)-2-OXO-2H-1-BENZOPYRAN-7-YL)-UREAS

Karl Heinz Becker, Darmstadt; Karl-Heinz Boltze, Bensberg-Kippekausen; Hans-Dieter Dell, Cologne, and Peter-Rudolf Seidel, Porz-Wahnheide, all of Germany, assignors to Troponwerke Dinklage & Company, Cologne, Germany

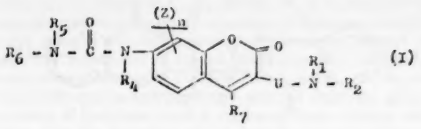
Filed July 15, 1972, Ser. No. 163,110

Claims priority, application Germany, July 17, 1970, 2035536; Feb. 20, 1971, 2108185

Int. Cl. C07d *87/42*

U.S. Cl. 260—246 B **20 Claims**

1. A compound of the formula (I)



(I)

wherein R_1, R_2, R_5, and R_6 are hydrogen, or straight-chain or branched-chain alkyl or mono hydroxyalkyl of up to 4 carbon atoms, cyclohexyl phenyl or phenyl substituted with one of chloro, hydroxy, lower alkyl or alkoxy of 1 to 3 carbon atoms, or trifluoromethyl; at least one of the radical pairs R_1 and R_2, and R_5 and R_6, when taken together with the adjacent nitrogen atom, represent alkyleneimino of from 2 to 6 ring carbon atoms or said alkyleneimino substituted by methyl; or morpholino, methylmorpholino, piperazino, 4-phenylpiperazine, or 4-alkyl or mono hydroxyalkyl piperazino wherein the alkyl moiety has up to 5 carbon atoms;

R_4 is hydrogen, lower alkyl of up to 3 carbon atoms;

R_7 is hydrogen, lower alkyl of up to 3 carbon atoms, or phenyl;

Z is chloro or lower alkyl of up to 3 carbon atoms;

n represents a number from 0 to 2, and

U is straight-chain or branched-chain lower alkylene, or monohydroxy- alkylene, of from 2 to 5 carbon atoms;

or the pharmacologically acceptable salts thereof.

3,897,427

2-PHENYL-2,3-DIHYDRO-BENZO [b]-THIOPHENE-1,1-DIOXIDE DERIVATIVES

Friedrich Sauter, Vienne, Austria, assignor to Centre d'Etudes pour l'Industrie Pharmaceutique, Toulouse, France

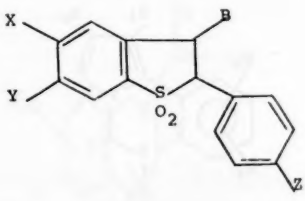
Filed Aug. 7, 1973, Ser. No. 386,387

Claims priority, application Austria, Aug. 21, 1972, 7179/72

Int. Cl.² C07D *333/66*

U.S. Cl. 260—247.1 P **9 Claims**

1. A compound having the formula:



in which X and Y are individually selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom and the lower alkyl groups having 1–4 carbon atoms; Z is selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom, the lower alkyl groups having 1–4 carbon atoms and the lower alkoxy groups having 1–4 carbon atoms; and B is a member selected from pyrrolidino, piperidino, morpholino, hexamethyleneimino, piperazino and piperazino substituted at the second nitrogen atom with an alkyl group having 1–3 carbon atoms; or a pharmaceutically acceptable acid addition salt of said compound.

3,897,428

DODECENOIC ACID AMIDES

Satoshi Omura; Iwao Umezawa; Toju Hata; Minoru Shindo; Masakazu Mizoguchi; Nobuhiro Oi, and Tomoharu Uchiyama, all of Tokyo, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha and The Kitasato Institute, both of Tokyo, Japan

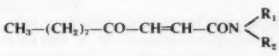
Filed Oct. 30, 1973, Ser. No. 411,024

Claims priority, application Japan, Nov. 11, 1972, 47-112581

Int. Cl. C07d *295/18*

U.S. Cl. 260—247.7 H **21 Claims**

1. A 4-keto-2-dodecenamide represented by the formula



wherein R_1 and R_2 may be the same or different and each represents hydrogen, alkyl having 1–6 carbon atoms, allyl, cyclohexyl, benzyl or hydroxyethyl or R_1 and R_2 may, when taken together with the nitrogen atom, form pyrrolidino, piperidino or morpholino.

3,897,429

THIOL METHYLATION WITH METHYL BROMIDE

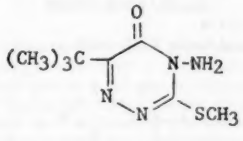
Frank R. Haglid, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 417,070, Nov. 19, 1973, abandoned. This application May 29, 1974, Ser. No. 474,436

Int. Cl. C07d *55/10*

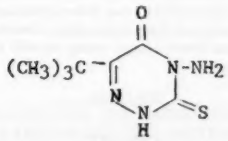
U.S. Cl. 260—248 AS **6 Claims**

1. In the process of synthesizing the compound



B

by methylating the compound



A

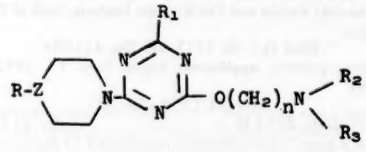
in the presence of a base in an aqueous medium, the improvement which comprises using methyl bromide as the methylating agent and regenerating the methyl bromide by reacting the process liquors with methanol and sulfuric acid.

3,897,430
SUBSTITUTED S-TRIAZINES AND METHOD OF USE

Harry Lee Lindsay; Robert Bruce Angier, and William Vincent Curran, all of Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 24, 1973, Ser. No. 399,909
Int. Cl. C07d *55/18*
U.S. Cl. 260—249.5 9 Claims

1. A trisubstituted-s-triazine selected from the group consisting of those of the formula:



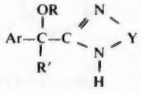
wherein R is hydrogen, lower alkyl, benzyl, phenyl, benzyloxycarbonyl or loweralkoxycarbonyl; R_1 is diloweralkylaminolower alkoxy, piperidinoloweralkoxy or methylpiperazinyl; R_2 and R_3 are lower alkyl; NR_2R_3 when taken together is piperidino; Z is nitrogen or CH; *n* is 2 or 3 and pharmaceutically acceptable acid addition salts thereof.

3,897,431
2[α-ALKOXY-ARYLMETHYL]-2-IMIDAZOLINES AND-,4,5,6-TETRAHYDROPYRIMIDINES

Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 26,787, April 8, 1970, abandoned, which is a continuation-in-part of Ser. No. 726,212, May 2, 1968, Pat. No. 3,657,229. This application Apr. 13, 1973, Ser. No. 350,949
Claims priority, application United Kingdom, Apr. 24, 1969, 20118/69
Int. Cl.[2] C07D *239/06*
U.S. Cl. 260—251 R 21 Claims

1. A compound having the formula



wherein

R is alkyl having from 2 to 6 carbon atoms,

R′ is hydrogen or lower-alkyl,

Y is alkylene of 3–8 carbon atoms in which 2 or 3 carbon atoms intervene between the valence linkages, and

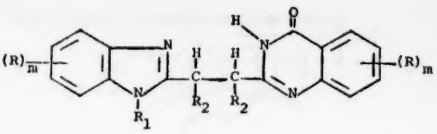
Ar is phenyl, naphthyl, indanyl, cyclohexenyl, cyclohexyl and phenyl substituted by two halo substituents or a single substituent selected from halo, nitro, lower-alkyl or lower-alkoxy, said lower-alkoxy being at only the para-position of phenyl.

3,897,432
SUBSTITUTED BENZIMIDAZOLE DERIVATIVES

Tsung-Ying Shen, Westfield; Victor J. Grenda, Warren, and Robert F. Czaja, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 136,186, April 21, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,383
Int. Cl. C07d *51/48*
U.S. Cl. 260—256.4 Q 3 Claims

1. A compound having the formula:



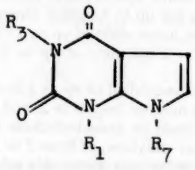
wherein each R is hydrogen or loweralkoxy, mono haloloweralkoxy, loweralkyl, with the proviso that when *m* is 2 and R is loweralkyl, R is non-tertiary lower alkyl, or when *m* is 2 the R groups together may form a methylenedioxy group; where halo defines fluorine, Chlorine and bromine; R_1 is hydrogen or loweralkyl; each R_2 is hydrogen or hydroxyl; m is 0, 1 or 2; and the non-toxic acid addition salts thereof.

3,897,433
1,7-DIHYDRO-1,3,7-TRI-LOWER-ALKYL-2H-PYRROLO [2,3-D] PYRIMIDINE-2,4(3H)-DIONES

Paul E. Dupont, and George Y. Lesher, both of Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Sept. 28, 1973, Ser. No. 401,647
Int. Cl.[2] C07D *239/00*
U.S. Cl. 260—256.4 F 3 Claims

1. A compound having the formula



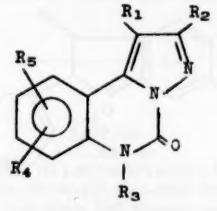
where R_1, R_3 and R_7 each represents the same or different lower-alkyl having from one to four carbon atoms.

3,897,434
PYRAZOLO[1,5-C]QUINAZOLIN-5(6H)-ONES

Allen S. Katner, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 12, 1974, Ser. No. 460,644
Int. Cl. C07d *51/48*
U.S. Cl. 260—256.4 Q 12 Claims

1. A pyrazolo[1,5-c]quinazolin-5(6H)-one of the formula



wherein R_1 is a monovalent group selected from the group consisting of hydrogen, C_1–C_4 alkyl, C_1–C_3 alkoxycarbonyl, phenyl, and monosubstituted phenyl in which the substituent is fluoro, chloro, bromo, C_1–C_3alkyl, or C_1–C_3alkoxy; R_2 is a monovalent group selected from the group consisting of carboxy, C_1–C_3 alkoxycarbonyl, acetyl, benzoyl, and monosubstituted benzoyl in which the substituent is fluoro, chloro,

bromo, C_1–C_3 alkyl, or C_1–C_3 alkoxy; R_3 is a monovalent group selected from the group consisting of hydrogen, methyl, benzyl, phenyl, and monosubstituted benzyl and phenyl in which the substituent is methyl, trifluoromethyl, methoxy, fluoro, chloro, bromo, or methylsulfonyl; and R_4 and R_5 are monovalent groups independently selected from the group consisting of hydrogen, methyl, methoxy, fluoro, chloro, and bromo, with the limitation that R_4 and R_5 must be different unless each of R_4 and R_5 is hydrogen.

3,897,435

N-OXIDES OF 1 -NITRO-9-DIALKYLAMINOALKYLAMINO/ACRIDINE

Andrzej Ledochowski, Gdansk, and Barbara Stefanska, Gdansk-Oliwa, both of Poland, assignors to Starogadzkie Zaklady Farmaceutyczne "Polfa", Starogard Gdanski, Poland

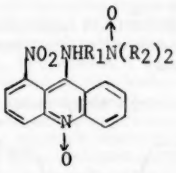
Continuation of Ser. No. 201,945, Nov. 24, 1971, abandoned, which is a division of Ser. No. 854,608, Sept. 2, 1969, Pat. No. 3,694,448. This application Oct. 4, 1973, Ser. No. 403,624

Claims priority, application Poland, Aug. 31, 1968, P128855

Int. Cl. C07d *37/24*

U.S. Cl. 260—279 A **2 Claims**

1. A compound of the formula



wherein R_1 is a straight or branched chain alkylene group having 1 to 4 carbon atoms and R_2 is a lower alkyl group having 1 to 3 carbon atoms: and pharmaceutically acceptable acid addition salts of said compound.

3,897,436

QUINOLINEACETIC ACID DERIVATIVES

Richard Goschke, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

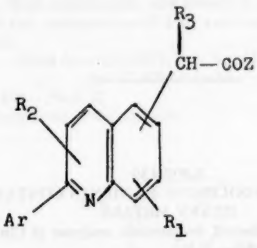
Filed Mar. 5, 1973, Ser. No. 337,998

Claims priority, application Switzerland, Mar. 10, 1972, 3549/72; Jan. 29, 1973, 1230/73

Int. Cl. C07d *33/48*

U.S. Cl. 260—283 S **16 Claims**

1. A quinolineacetic compound of the formula



(I)

wherein Ar denotes phenyl, thienyl or phenyl substituted by one or two identical members selected from lower alkyl, lower alkoxy, fluoro, chloro, bromo, trifluoromethyl, amino, di-lower alkylamino, or hydroxy, R_1 represents hydrogen, fluoro, chloro, bromo, lower alkyl, lower alkoxy or trifluoromethyl and R_2 and R_3 independently of one another denote hydrogen or lower alkyl, wherein Z is OH, NH_2, OR, NHR, NRR, or NHOH where R is lower alkyl in which "lower" defines one to seven carbon atoms, or a pharmaceutically acceptable non-toxic salt thereof.

3,897,437

CERTAIN SUBSTITUTED ANILINO-PHENYLACETIC-ACID-(2,3 OR 4-PYRIDYL)-ETHYL ESTERS AND DERIVATIVES

Georges Haas, Oberwil, and Alfred Sallmann, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

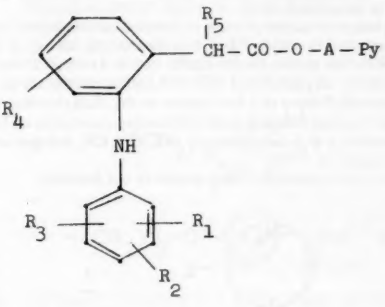
Filed Aug. 10, 1973, Ser. No. 387,405

Claims priority, application Switzerland, Aug. 16, 1972, 12128/72

Int. Cl.[2] C07D *31/34*

U.S. Cl. 260—295 R **14 Claims**

1. Substituted phenylacetic acid esters of the general formula I



(I)

in which R_1 represents lower alkyl, lower alkoxy, halogen up to and including atomic number 35 or trifluoromethyl, R_2 represents hydrogen or a substituent corresponding to the definition of R_1, R_3 represents hydrogen, lower alkyl, lower alkoxy, halogen up to and including atomic number 35, R_4 represents hydrogen, lower alkyl, lower alkoxy, halogen up to and including atomic number 35 or trifluoromethyl, R_5 represents hydrogen, lower alkyl or benzyl, A represents a direct bond, lower alkylene or lower alkylidene and P represents unsubstituted, lower alkyl-substituted or lower alkoxy-substituted pyridyl wherein "lower" denotes said straight-chain radicals with up to 4 carbon atoms, the N-oxide or pharmacologically tolerable acid addition salts thereof.

3,897,438

PROCESS FOR THE PRODUCTION OF N-(1,1,1-TRISUBSTITUTED)-METHYLAZOLES

Wilfried Draber, and Erik Regel, both of Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer AG, Germany

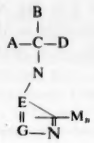
Filed Feb. 19, 1971, Ser. No. 117,161

Claims priority, application Germany, Feb. 26, 1970, 2009020

Int. Cl. C07d *31/00, 55/02*

U.S. Cl. 260—296 R **53 Claims**

1. A process for the preparation of an N-(1,1,1-tri-substituted)-methylazole of the formula:



in which

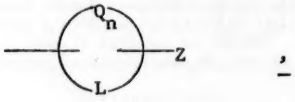
A is straight or branched chain alkyl of 1 to 8 carbon atoms, straight or branched chain alkenyl of up to 8 carbon atoms, cyclopropyl, cyclopentyl, cyclohexyl, bicyclo-heptyl or adamantyl, or

A is phenyl, naphthyl, pyridyl or imidazole each of which is unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylmercapto of 1 to 4 carbon atoms, phenoxy, alkylsulphonyl of 1 to 4 carbon atoms, amino, mono-alkylamino of 1 to 4 carbon atoms, dialkylamino of 1 to 4 carbon atoms in each alkyl moiety, carboxyl, carbalkoxy of 1 to 4 carbon atoms, nitro, cyano, trifluoromethyl, halogen or hydroxyl;

B is straight or branched chain alkyl of 1 to 8 carbon atoms, straight or branched chain alkenyl of up to 8 carbon atoms, cyclopropyl, cyclopentyl, cyclohexyl, bicyclo-heptyl or adamantyl, or

B is phenyl or naphthyl each of which is unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylmercapto of 1 to 4 carbon atoms, phenoxy, alkylsulphonyl of 1 to 4 carbon atoms, amino, mono-alkylamino of 1 to 4 carbon atoms, dialkylamino of 1 to 4 carbon atoms in each alkyl moiety, carboxyl, carbalkoxy of 1 to 4 carbon atoms, NO_2, CN, CF_3, halogen or hydroxyl, or

B is a 5- or 6-membered ring system of the formula:



wherein

L is oxygen, sulphur, >N-alkyl of 1 to 4 carbon atoms, >N-phenyl or CH;

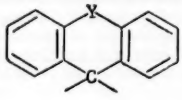
Q is nitrogen or CH;

Z is hydrogen, alkyl of 1 to 4 carbon atoms, halogen or phenyl, and

n is 1 or 2; or

A and B together with the central carbon atom are linked to form an aliphatic ring with 3–7 carbon atoms; or

A and B are linked to one another so that together with the central carbon atom to which they are linked they form a ring system of the formula:



wherein

Y is a direct bond, sulphur oxygen, alkylene of 1 to 3 carbon atoms or CH=CH;

D is straight or branched chain alkyl of 1 to 8 carbon atoms, straight or branched chain alkenyl of up to 8 carbon atoms, cyclopropyl, cyclopentyl, cyclohexyl, bicyclo-heptyl or adamantyl, or

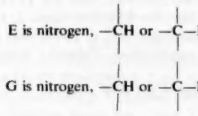
D is phenyl or naphthyl each of which is unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylmercapto of 1 to 4 carbon atoms, phenoxy, alkylsulphonyl of 1 to 4 carbon atoms, amino, mono-alkylamino of 1 to 4 carbon atoms, dialkylamino of 1 to 4 carbon atoms in each alkyl moiety, carboxyl, carbalkoxy of 1 to 4 carbon atoms, nitro, cyano, trifluoromethyl, halogen or hydroxyl; or

D is alkoxy-carbonyl of 1 to 4 carbon atoms in the alkoxy moiety, alkoxy-carbonyl-alkyl of 1 to 4 carbon atoms in each of the alkoxy and alkyl moieties, or

D is a 5- or 6-membered ring system of the formula:

wherein

Q, L, Z and *n* have the same meaning as above; and in which



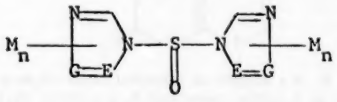
wherein

R^1 and R^2 together with the carbon atoms of E and G form a fused benzene ring;

M is hydrogen, alkyl of 1 to 4 carbon atoms, phenyl, naphthyl, or alkoxy-carbonyl of 1 to 4 carbon atoms in the alkyl moiety; and

m is 1, 2 or 3,

which comprises reacting a thionyl-azolide of the formula:



in which

E, G, M and *m* have the same meaning as above, with a carbinol of the formula:

in which

A, B and D have the same meaning as above, in a dry organic solvent inert to the reaction at a temperature in the range of −20° C to +150° C.

3,897,439

CERTAIN ISOINDOLINONE PIGMENTS CONTAINING HEAVY METALS

Christoph Frey, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

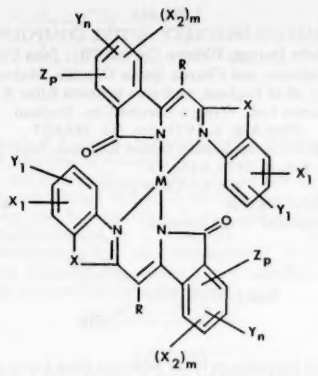
Filed Nov. 21, 1973, Ser. No. 417,849

Claims priority, application Switzerland, Dec. 4, 1972, 17625/72

Int. Cl. C07d *27/50*

U.S. Cl. 260—299 **8 Claims**

1. An isoindolinone pigment of the formula



wherein *m* denotes a polyvalent metal atom selected from the group consisting of zinc, cadmium, nickel, copper and cobalt X denotes O, S or imino, X_1 and Y_1 denote H, halogen, alkyl containing 1 to 6 carbon atoms, alkoxy containing from 1 to 6 carbon atoms, alkoxycarbonyl containing from 1 to 6 carbon atoms, alkylsulphonyl containing from 1 to 6 carbon atoms, alkylcarbamoyl containing 1 to 6 carbon atoms, nitro, carbamoyl or phenylcarbamoyl, or the radicals X_1 and Y_1 form a fused benzene ring, X_2 denotes H, Y denotes halogen and Z denotes nitro, carbamoyl or phenylcarbamoyl selected from the group consisting of para-chlorophenylcarbamoyl, phenylcarbamoyl, and para-methylphenylcarbamoyl, or a group of the formula R_1Y_2—, wherein R_1 represents H, alkyl containing from 1 to 6 carbon atoms, cycloalkyl containing 1 to 6 carbon atoms or phenyl and Y_2 represents O or S, *m* denotes 0–4, *n* denotes 0–4, *p* denotes 0–3 and the sum of *m*+*n*+*p* must be 4.

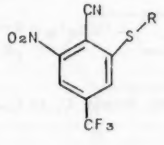
3,897,440

2-CYANO-3-NITRO-5-TRIFLUOROMETHYL PHENYL THIO PYRIDINES

James R. Beck, Indianapolis, and Robert G. Suhr, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 23, 1973, Ser. No. 418,511
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 G **4 Claims**

1. A compound of the formula



wherein
R is 2-pyridyl, 2-pyridyl-N-oxide, 4-pyridyl.

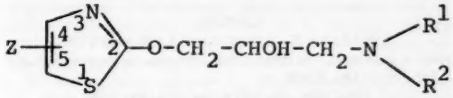
3,897,441

CERTAIN THIAZOLE-CARBOXAMIDES AND ACYLAMINO-THIAZOLES

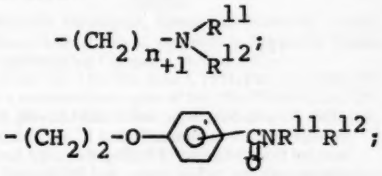
John A. Edwards, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 289,730, Sept. 15, 1972, Pat. No. 3,850,945, which is a continuation-in-part of Ser. Nos. 193,172, Oct. 27, 1971, abandoned, and Ser. No. 343,945, March 22, 1973, abandoned, which is a continuation-in-part of Ser. No. 289,730, Sept. 15, 1972, which is a continuation-in-part of Ser. No. 193,172, Oct. 27, 1971, abandoned. This application Mar. 14, 1974, Ser. No. 451,179
Int. Cl. C07d *91/32, 91/34*
U.S. Cl. 260—302 R **50 Claims**

1. A compound selected from the group having the formula:



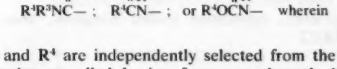
wherein R^1 and R^2 are independently selected from the group of hydrogen, lower alkyl, cycloalkyl having from three through seven ring atoms, lower alkenyl, phenyl, lower phenylalkyl wherein said alkyl has from one through six carbon atoms, or substituted phenyl or substituted lower phenylalkyl wherein said phenyl has one or two substituents independently selected from the group of hydroxy, lower alkyl, lower alkoxy and halo, and groups having the formulas



or $-(CH_2)_n$-Y′ wherein *n* is a whole integer of from one through four; R^{11} and R^{12} are independently hydrogen or lower alkyl; and Y′ is a heterocycle selected from the group of morpholino, pyrrolidinyl, piperidinyl, piperazinyl, N′-lower alkylpiperazinyl or N′-lower hydroxyalkylpiperazinyl derivatives thereof; or

R^1 and R^2 together with the nitrogen atom to which they are joined form a nitrogen heterocycle selected from the group of morpholino, pyrrolidinyl, piperidinyl, piperazinyl, N′ 1 lower alkylpiperazinyl, or N′-lower hydroxyalkylpiperazinyl;

Z is a substituent on the thiazole ring at either the 4- or 5-position selected from the group having the formulas:



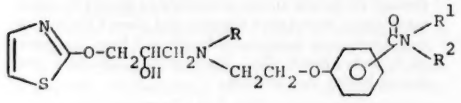
R^3 and R^4 are independently selected from the group of hydrogen; alkyl having from one through 12 carbon atoms; cycloalkyl having from three through 12 carbon atoms; phenyl; lower phenylalkyl wherein said alkyl has from 1 through 6 carbon atoms, or substituted phenyl or substituted lower phenylalkyl wherein said phenyl has one or two substituents independently selected from the group of hydroxy, lower alkyl, lower alkoxy, or halo; terminally substituted alkyl group having from two through 12 carbon atoms having one substituted terminal carbon atom having a substituent selected from the group of hydroxy, acyloxy selected from the group consisting of benzoyloxy, phenylacetyloxy, phenylpropionyloxy, o-toluoyloxy, m-toluoloxy, p-toluoyloxy, β-cyclopentylpropionyloxy and alkanoyloxy having from two through 12 carbon atoms and alkoxy having from 1 through 6 carbon

atoms; and groups having the formulas $-(CH_2)_{n+1}NR^8R^9$ or $-(CH_2)_nR^{10}$ wherein n is a whole integer of from 1 through 4, R^8 and R^9 are independently selected from the group of hydrogen and alkyl groups having from one through four carbon atoms and R^{10} is cycloalkyl having from three through eight carbon atoms; and wherein when Z is

then R^4 cannot be hydrogen;
and pharmaceutically acceptable salts thereof.

3,897,442
THIAZOLE CARDIOVASCULAR AGENTS
John A. Edwards, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed Mar. 14, 1974, Ser. No. 451,195
Int. Cl. C07d *91/32*
U.S. Cl. 260—302 R **14 Claims**

1. A compound selected from the group having the formula:



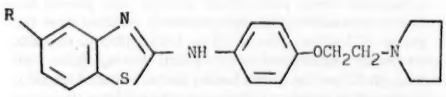
(I)

wherein R is hydrogen or lower alkyl having from one through six carbon atoms; R^1 and R^2 are independently selected from the group of hydrogen or alkyl having from one through ten carbon atoms; and the group

can be at any position on the phenyl ring;
and pharmaceutically acceptable salts thereof.

3,897,443
PHARMACOLOGICALLY ACTIVE ANILINOBENZOTHIAZOLES
Christopher James Sharpe, Harrow Weald, England, assignor to The Boots Company Limited, Nottingham, England
Filed Mar. 21, 1973, Ser. No. 343,565
Claims priority, application United Kingdom, Mar. 30, 1972, 15018/72
Int. Cl. C07d *99/10*
U.S. Cl. 260—305 **4 Claims**

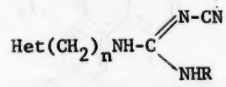
1. A benzothiazole compound selected from the group consisting of a compound of the formula



and a pharmaceutically acceptable acid addition salt thereof, wherein R is a member selected from the group consisting of hydrogen and methoxy.

3,897,444
PHARMACOLOGICALLY ACTIVE COMPOUNDS
Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Ltd., Welwyn Garden City, England
Filed Aug. 2, 1973, Ser. No. 385,027
Claims priority, application United Kingdom, Sept. 5, 1972, 41160/72; Feb. 8, 1973, 6154/73
Int. Cl. C07d *49/36*
U.S. Cl. 260—306.8 R **6 Claims**

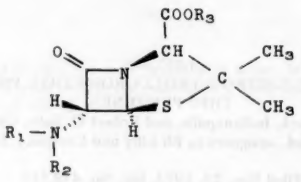
1. A compound of the formula:



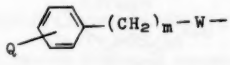
wherein R is hydrogen or lower alkyl; n is from 3 to 5; and Het is an unsaturated heterocyclic nucleus selected from imidazole, thiazole, isothiazole, oxazole, isoxazole, pyrazole, triazole, thiadiazole, pyrimidine, pyrazine and pyridazine which nucleus is attached through a carbon atom in said nucleus adjacent to a nitrogen atom and is unsubstituted or monosubstituted by lower alkyl, trifluoromethyl, hydroxyl, halogen or amino, or a pharmaceutically acceptable acid addition salt thereof.

3,897,445
5-EPI-PENICILLINS
Stjepan Kukolja, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Continuation-in-part of Ser. No. 148,129, May 28, 1971, abandoned. This application July 15, 1971, Ser. No. 165,758
Int. Cl. C07d *99/16*
U.S. Cl. 260—306.7 C **10 Claims**

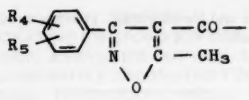
1. A 5-epi-penicillin compound of the formula



wherein R_1, taken alone, denotes an acyl group of the formula R_a-CH_2-CO-
where R_a is



Q is hydrogen, chloro, bromo, C_1 to C_3-alkyl, C_1 to C_3-alkyloxy,
nitro or cyano,
W is oxygen, or a chemical bond;
and *m* is an integer of from 0 to 2;
R_2, taken alone, is defined as R_1 above, or is



where each of R_4 and R_5 is hydrogen or a halogen (fluorine, chlorine, bromine or iodine);

or R_1 and R_2 are taken together with the nitrogen to which they are bonded to form a succinimido or phthalimido group, and R_3 is hydrogen, C_1 to C_4-alkyl, p-nitrobenzyl, p-methoxybenzyl, benzyl, benzhydryl, phthalimidomethyl, succinimidomethyl, 2,2,2-trichloroethyl, trimethylsilyl, phenacyl, or p-halophenacyl where halo denotes chlorine or bromine.

3,897,446

6-PHENYLTHIAZOLO[3,2-A][1,4]BENZODIAZEPIN-1-(2H)-ONES, AND PROCESSES

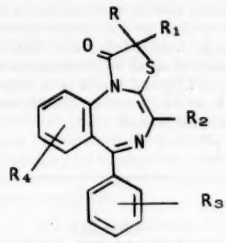
Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 4, 1973, Ser. No. 394,043

Int. Cl. C07d *99/10*

U.S. Cl. 260—306.7 R **11 Claims**

1. A 6-phenylthiazolo[3,2-a][1,4]benzodiazepin-1(2H)-one of the formula:



wherein R, R_1 and R_2 are each hydrogen or alkyl of 1 to 3 carbon atoms, inclusive, i.e., methyl, ethyl, propyl or isopropyl; and R_3 and R_4 are each hydrogen, alkyl, as defined above, halogen, nitro, trifluoromethyl or alkylthio in which alkyl has the meaning given, above, and the pharmacologically acceptable acid addition salts thereof.

3,897,447

ANTHELMINTIC 1,2,4-OXADIAZOLINES

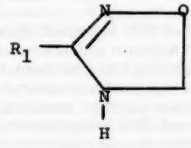
Michael H. Fisher, Bridgewater Twp., Somerville County, and Alexander R. Matzuk, Colonia, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 30, 1973, Ser. No. 355,848

Int. Cl. C07d *85/52*

U.S. Cl. 260—307 F **2 Claims**

1. A compound of the formula =



wherein R_1 is C_1 to C_4 alkyl.

3,897,448

PROCESS FOR THE MANUFACTURE OF ALKYL BENZIMIDAZOLYLCARBAMATES

Jose Moyne, Claurie, France, assignor to Rhone-Progil, Courbevoie, France

Filed Oct. 30, 1973, Ser. No. 411,023

Claims priority, application France, Nov. 30, 1972, 72.43306

Int. Cl. C07d *233/66*

U.S. Cl. 260—309.2 **3 Claims**

1. In a process for the manufacture of alkyl benzimidazolylcarbamate by first stage reaction of an alkyl chloroformate, with the alkyl having 1–4 carbons, with cyanamide or an alkali or alkaline earth metal or magnesium salt thereof in an aqueous medium at a pH between 6 and 13, and then by second stage reaction of the obtained alkylcyanocarbamate with an orthophenylenediamine substituted by H, halogen, NO_2 or alkyl of 1–4 carbons in the presence of a molar quantity of acid at at least equal to the molar quantity of diamine,

the improvement wherein the alkyl cyanocarbamate medium from said first stage reaction is first acidified and then the alkylcyanocarbamate is extracted from the aqueous acidified medium with an organic water-immiscible solvent, and then said alkylcyanocarbamate is reacted in this same solvent with the orthophenylene diamine to provide said second stage reaction.

3,897,449

N-(2-BENZIMIDAZOLYL)FLUOROALKANESULFONAMIDES

Joseph Kenneth Harrington, Edina, and Robert D. Trepka, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 150,789, June 7, 1971, Pat. No. 3,766,193, which is a continuation-in-part of Ser. No. 795,050, Jan. 29, 1969, Pat. No. 3,629,332. This application July 12, 1973, Ser. No. 378,620

Int. Cl. C07d *49/38*

U.S. Cl. 260—309.2 **4 Claims**

1. A compound of the formula

$$R_fSO_2NH—R—Ar$$

wherein R_f is fluoroalkyl of one or two carbon atoms and with at least two fluorine atoms, R is alkylene of one or two carbon atoms and Ar is 2-benzimidazolyl, or a horticulturally acceptable salt thereof.

3,897,450

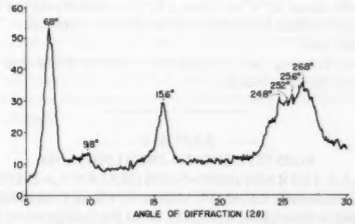
METAL PHTHALOCYANINE TYPE PIGMENT

Shojiro Horiguchi; Yoshio Abe, and Tohoru Hosoda, all of Tokyo, Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co. Ltd., Tokyo, Japan

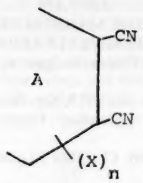
Filed Feb. 10, 1970, Ser. No. 10,204

Int. Cl. C09b *47/04*

U.S. Cl. 260—314.5 **17 Claims**



1. A method for producing a copper phthalocyanine pigment which comprises subjecting an o-dinitrile type compound having a formula of



wherein A is an aryl radical or pyridinyl radical, X is hydrogen or halogen atom, nitro, amino, sulfonic acid, carboxylic acid, alkyl, methoxy or ethoxy radical, and *n* is an integer of 1–4 when X is hydrogen or halogen atom, and *n* is an integer of 1–2 when X is nitro, amino, sulfonic acid, carboxylic acid, alkyl, methoxy or ethoxy radical and 0.25 mol or more per mole of o-dinitrile type compound of a metallic substance capable of forming a central nucleus of the phthalocyamine pigment selected from the group consisting of copper powder, cuprous oxide, cupric oxide, cuprous chloride, cupric chloride, couprous bromide, cupric bromide, copper sulfate, copper nitrate, copper phosphide, and copper acetate, to condensation reaction at a temperature ranging from 100℃ to room temperature in the presence of 0.1 – 2 mols per mol of the o-dinitrile type compound of an alkaline substance selected from the group consisting of hydroxide, oxide, peroxide, and carbonate of alkali metal and of alkaline earth metal and a hydrophilic organic solvent having hydroxy radical selected from the group consisting of methanol, ethanol, propanol, isopropanol, butanol, isobutanol, secondary butanol, ethylene glycol, propylene glycol, polyethylene glycol, methyl cellosolve, ethyl cellosolve, diethylene glycol ethyl ether, phenol, o, -m-, and p-cresol.

3,897,451

SYNTHESIS OF OXINDOLES FROM ANILINES AND INTERMEDIATES THEREIN

Paul G. Gassman, Columbus, Ohio, assignor to The Ohio State University Research Foundation, Columbus, Ohio

Filed Apr. 27, 1973, Ser. No. 355,207
Int. Cl. C07d *27/40*
U.S. Cl. 260—325 R **5 Claims**

1. A process for preparing 2-oxindoles which comprises
   a. reacting an N-haloaniline with a β-thio compound selected from the group consisting of a lower-alkyl β-thioalkanoate ester and a lower-alkyl β-thioalkanoyl acylamide in organic liquid diluent under substantially anhydrous conditions at a temperature of from about −78° C to about 10° C to form an azasulfonium salt;
   b. reacting the azasulfonium salt from step (a) with a substantially anhydrous base which will cause formation of an ylid intermediate to form an ortho-[(thioalkyl) (alkylthiocarbonyl)methyl]-aniline,
   c. heating the ortho-substituted aniline from step (b) to from about 50° C to about 150° C or acidifying the substituted aniline from step (b) to form a 3-thioalkyl-2-oxindole, and
   d. desulfurizing the 3-thioalkyl-2-oxindole from step (c) to form the 2-oxindole.

3,897,452

SUBSTITUTED 1,4-DIHYDRO(AND 1,2,3,4-TETRAHYDRO)-NAPHTHALEN-1,4-IMINES

Paul S. Anderson, Lansdale; Marcia E. Christy, Perkasie, and Gerald S. Ponticello, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 19, 1974, Ser. No. 498,485
Int. Cl. C07d *27/48*
U.S. Cl. 260—326.1 **6 Claims**

1. 2-Chloro-5,6,7,8-tetrafluoro-2,9-dimethyl-1,2,3,4-naphthalen-1,4-imine and the non-toxic, pharmaceutically acceptable salts thereof.

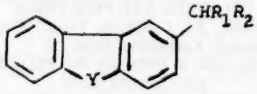
3,897,453

DIBENZOFURAN AND DIBENZOTHIOPHENE ACETIC ACID DERIVATIVES

Joachim Gante; Werner Mehrhof, and Albrecht Wild, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed May 10, 1973, Ser. No. 358,872
Claims priority, application Germany, May 13, 1972, 2223391; Dec. 16, 1972, 2261745
Int. Cl. C07d *63/24*
U.S. Cl. 260—329.3 **27 Claims**

1. A compound of the formula



substituted in the 1-, 3-, 4-, 6-, 7-, 8-, or 9-position by R_3 wherein R_1 is $COOR_5$ in which R5 is hydrogen, alkyl of 1 to 20 carbon atoms or aminoalkyl, alkylaminoalkyl, or dialkylaminoalkyl wherein alkyl in each instance is of up to 8 carbon atoms; R_2 is H or alkyl of 1–4 carbon atoms; R_3 is H, alkyl, alkoxy, alkanoyl, monoalkylamino, dialkylamino, or alkanoylamino, each of up to 4 carbon atoms, F, Cl, Br, I, OH, NH_2, NO_2, CN, or CF_3; and Y is O or S; with the proviso that at least one of R_2 and R_3 are other than H; and the physiologically acceptable salts thereof.

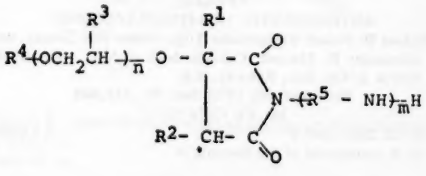
3,897,454

POLYALKYLENE GLYCOL POLYALKYLENE POLYAMINE DISPERSANTS FOR LUBRICANT FLUIDS

Tad L. Hankins, Fullerton, Calif., and Ting-I Wang, Cherry Hill, N.J., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 765,959, Oct. 8, 1968, abandoned. This application June 11, 1973, Ser. No. 368,678
Int. Cl.² C07D *27/00*
U.S. Cl. 260—326.5 FM **12 Claims**

1. A compound having the following structures:

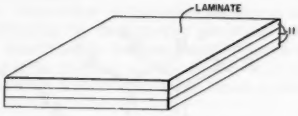


wherein each R^1 and R^2 is independently selected from the group consisting of hydrogen and monovalent hydrocarbonaceous radicals containing less than about 10 carbon atoms, each R^3 and R^4 is independently selected from the group consisting of hydrogen and alkyl containing from 1 to about 10 carbon atoms, each R^5 is independently selected from the group consisting of divalent hydrocarbonaceous radicals containing from 1 to about 3 carbon atoms, *n* is a positive integer in the range from about 1 to about 100 and m is a positive integer from about 1 to about 10.

3,897,455
IMPREGNATING COMPOSITION COMPRISING AN EPOXY RESIN, ANHYDRIDES OF NMA AND BTDA AND GLASS-EPOXY LAMINATED THEREOF

Zal N. Sanjana, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 11, 1973, Ser. No. 423,850
Int. Cl. C08g *30/12, 51/34*
U.S. Cl. 260—32.8 EP 7 Claims



1. A homogeneous, stable resinous impregnating composition consisting essentially of the admixture of:

A. a liquid mixture of;

a. liquid epoxy resin selected from the group consisting of diglycidyl ethers of bisphenol A, polyglycidyl ethers of a novolac and mixtures thereof,

b. liquid NADIC methyl anhydride, and

B. solid benzophenone-tetracarboxylic dianhydride, wherein the anhydride equivalent weight ratio of NADIC methyl anhydride: benzophenonetetracarboxylic dianhydride is from about 0.50 to 0.90:1, to provide a homogeneous, stable dispersion of the solid dianhydride in the liquid characterized by having a pot life of over 2 days at 25°C, a curing temperature of about 170°–185°C and containing between about 98 to 100 percent undissolved benzophenone - tetracarboxylic dianhydride and wherein the total anhydride plus dianhydride content is within the range of from about 0.60 to 0.95 anhydride equivalents for each epoxy equivalent.

3,897,456
SLUDGE INHIBITOR FOR HYDROCARBON OILS

Phillip W. Brewster, Wyoming, Canada, assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 16, 1973, Ser. No. 333,047
Int. Cl. C07d *87/54*
U.S. Cl. 260—340.2 2 Claims

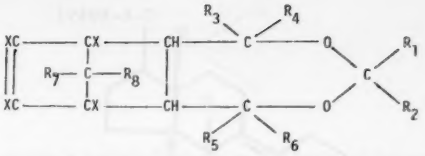
1. The oil-soluble ester obtained by the esterification of about equal molar proportions of (a) a polyisobutenyl succinic acid or acid anhydride wherein said polyisobutenyl group contains between 40 and 250 carbon atoms with (b) a tetrahydroxyalkyl-substituted urea which is the condensation product of 1 molar proportion of urea with about 2 molar proportions of a dialkanolamine having from 1 to 6 carbon atoms in each alkanol group.

3,897,457
HALOGEN CONTAINING TRICYCLIC COMPOUNDS

Sheldon B. Greenbaum, Livingston; Edward D. Weil, Yonkers, and Jack S. Newcomer, Wilson, all of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 787,245, Dec. 26, 1968, Pat. No. 3,687,831, which is a continuation-in-part of Ser. No. 589,811, Oct. 27, 1966, abandoned, which is a continuation-in-part of Ser. No. 16,965, March 23, 1960, abandoned. This application Aug. 15, 1972, Ser. No. 280,921
Int. Cl. C07d *15/00*
U.S. Cl. 260—340.3 2 Claims

1. A compound having the formula



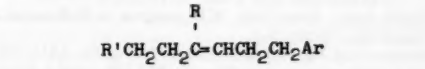
wherein X is halogen, R_1 and R_2 taken together form a cycloalkyl group of 4 to 7 carbon atoms; R_3, R_4, R_5 and R_6 are independently selected from the group consisting hydrogen, alkyl of 1 to 6 carbon atoms, alkoxylalkyl of 2 to 12 carbon atoms, cycloalkyl of 4 to 7 carbon atoms, alkenyl of 2 to 6 carbon atoms, monochloroalkenyl of 2 to 6 carbon atoms, phenyl, mono-nitrophenyl, benzyl, tolyl, and xylyl; and R_7 and R_8 are selected from the group consisting of hydrogen, halogen, alkoxy of 1 to 6 carbon atoms and alkylmercapto of 1 to 6 carbon atoms.

3,897,458
ARYLALKENYL NITRILES AND FUNCTIONAL DERIVATIVES THEREOF

Guy D. Diana, Stephentown, and William B. Hinshaw, Jr., Sand Lake, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Jan. 17, 1973, Ser. No. 324,340
Int. Cl.[2] C07D *317/06*
U.S. Cl. 260—340.5 7 Claims

1. A compound of the formula



wherein R is lower-alkyl of 1 to 4 carbon atoms; R′ is a member of the group consisting of N ≡ C—, HOOC—, H_2NCO—, H_2NCH_2— and Ar′CONHCH$_2$—; Ar is 3,4-methylenedioxyphenyl; and Ar′ is phenyl or phenyl substituted by 3,4-methylenedioxy or one or two monovalent substitutents selected from the group consisting of lower-alkyl of 1 to 4 carbon atoms, lower-alkoxy of 1 to 4 carbon atoms, halogen, trifluoromethyl and trifluoromethoxy.

3,897,459
5-OXO-1β-CYCLOPENTANE HEPTANOIC ACID DERIVATIVE

Chan-Hwa Kuo, South Plainfield; David Taub, Metuchen, and Norman L. Wendler, Summit, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 290,590, Sept. 20, 1972, Pat. No. 3,850,952. This application Oct. 15, 1973, Ser. No. 406,758
Int. Cl. C07c *69/74*
U.S. Cl. 260—340.9 4 Claims

1. 3β-Acetoxy-2α-carboxy-5-oxo-1β-cyclopentaneheptanoic acid, 5-cyclic ethylene acetal and loweralkyl and benzyl or xylyl esters thereof.

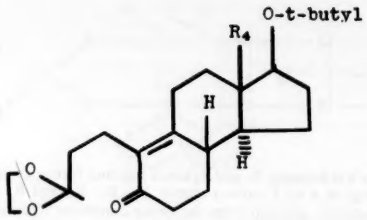
3. 3β-Acetyl-2α-carboxy-5-oxo-1β-cyclopentaneheptanoic acid, 5-cyclic ethylene acetal and loweralkyl or benzyl or xylyl esters thereof.

3,897,460
3β-TERTIARYBUTOXY-DECAHYDRO-BENZ[E]INDENES

Zoltan George Hajos, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 4, 1968, Ser. No. 765,023
Int. Cl. C07d *13/04*
U.S. Cl. 260—340.9 3 Claims

1. A compound of the formula



wherein R_4 is methyl, ethyl or propyl.

3,897,461

9-ALKOXIME DECANSIC ACID-Δ-LACTONES

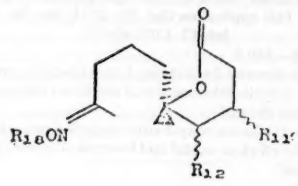
Gabriel Saucy, Essex Fells, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 57,372, July 22, 1970, Pat. No. 3,816,458, and a continuation-in-part of Ser. No. 813,693, April 4, 1969, abandoned, said Ser. No. 57,372, is a continuation-in-part of Ser. No. 679,989, Nov. 2, 1967, abandoned, which is a continuation-in-part of Ser. No. 633,730, April 26, 1967, abandoned, which is a continuation-in-part of Ser. No. 604,124, Dec. 23, 1966, abandoned, which is a continuation-n-part of Ser. No. 549,816, May 13, 1966, abandoned, continuation-in-part of Ser. No. 813,693, April 4, 1969, abandoned. This application Mar. 13, 1974, Ser. No. 450,710

Int. Cl.[2] C07D *309/30*

U.S. Cl. 260—343.5 **1 Claim**

1. A compound of the formula



where R_{11} and R_{12} are each independently hydrogen and R_{18} is lower alkyl.

3,897,462

2-AMINO-4 H-PYRANE

Horst Meyer; Friedrich Bossert, both of Wuppertal; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

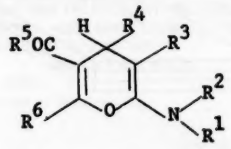
Filed July 2, 1973, Ser. No. 375,809

Claims priority, application Germany, July 19, 1972, 2235406

Int. Cl. C07d *7/14*

U.S. Cl. 260—345.8 **16 Claims**

1. A compound of the formula



wherein

R^1 and R^2 are each hydrogen;

R^3 is —COOR′ wherein R′ is lower alkyl; lower alkenyl; or lower alkynyl; R^4 is phenyl unsubstituted or substituted by 1, 2 or 3 of the same or different substituents selected from the group consisting of lower alkyl, lower alkoxy, halogen, nitro, cyano, trifluoro methyl, carb(lower alkoxy) and $—SO_n$ lower alkyl wherein n is 0, 1 or 2, or naphthyl; R^5 is —OR″ wherein R″ is lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl of 3 to 7 carbon atoms, or lower alkyl interrupted by 1 oxygen atom; and R^6 is lower alkyl.

3,897,463

INSECTICIDAL N-THIO-SUBSTITUTED CARBAMATES OF DIHYDROBENZOFURANOLS

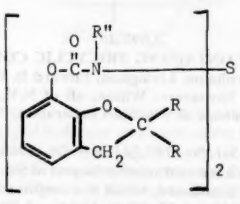
Gustave K. Kohn, Berkeley, Calif.; Melancthon S. Brown, deceased, late of Alameda, Calif., and by Gustave K. Kohn, special administrator, Berkeley, Calif.

Division of Ser. No. 317,317, Dec. 21, 1972, which is a continuation-in-part of Ser. Nos. 235,796, March 17, 1972, abandoned, and Ser. No. 235,797, March 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,117, Feb. 28, 1972, Pat. No. 3,792,169, which is a division of Ser. No. 855,421, Sept. 4, 1969, Pat. No. 3,663,594, which is a continuation-in-part of Ser. No. 764,299, Oct. 1, 1968, abandoned, and a continuation-in-part of Ser. No. 250,908, May 8, 1972, Pat. No. 3,843,689. This application July 29, 1974, Ser. No. 490,178

Int. Cl. C07d *5/36*

U.S. Cl. 260—346.2 R **5 Claims**

1. A compound of the formula



wherein R individually is hydrogen or alkyl of one to four carbon atoms and R″ is hydrogen or alkyl of one to four carbon atoms.

3,897,464

OXIDATION OF NAPHTHALENE TO 1,4-NAPHTHOQUINONE AND PHTHALIC ANHYDRIDE

Heinz Dohm; Karl Morgenstern, both of Krefeld; Ludwig Müller, Krefeld-Bockum, and Rudolf Wiemers, Meerbusch all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 12, 1973, Ser. No. 350,569
Claims priority, application Germany, July 12, 1972, 2234306; Mar. 15, 1973, 2312838
Int. Cl. C07d *63/18, 49/66*
U.S. Cl. 260—346.4 12 Claims

1. In the production of 1,4-naphthoquinone along with phthalic anhydride by the catalytic gas phase oxidation of sulfur free naphthalene, the improvement which comprises maintaining in the reaction space a sulphur concentration of about 0.002 to about 0.05% by weight based on the naphthalene used.

3,897,465

ETHYL BETA-(N-METHYLFURFURYLAMINO) PROPIONATE

Morton W. Leeds, Murray Hill, and Alex J. Szur, North Plainfield, both of N.J., assignors to Airco, Inc., Montvale, N.J.

Division of Ser. No. 129,129, March 29, 1971, Pat. No. 3,760,082. This application May 7, 1973, Ser. No. 357,964
Int. Cl. C07d *5/16*
U.S. Cl. 260—347.4 3 Claims

1. A compound selected from the group consisting of ethyl β-(N-methylfurfurylamino) propionate and a water soluble salt of ethyl β-(N-methylfurfurylamino) propionate.

3,897,466

METHOD OF PREPARING N^{ω}-ACYL BASIC AMINO ACIDS

Koichi Takizawa, Yokohama, and Ryonosuke Yoshida, Kamakura, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Apr. 23, 1973, Ser. No. 353,634
Claims priority, application Japan, Apr. 25, 1972, 47-41912
Int. Cl. C07c *103/30*
U.S. Cl. 260—404.5 9 Claims

1. A method of preparing an N^{ω}-acyl derivative of a basic amino acid having an ω-amino group which comprises holding a salt of said basic amino acid and a carboxylic acid free from amino groups at a temperature of 100° to 250°C until water is released, and said N^{ω}-acyl derivative is formed, acyl in said derivative being the acyl radical of said carboxylic acid.

3,897,467

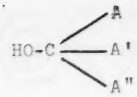
PROCESS FOR THE PREPARATION OF α-KETOCARBOXYLIC ACIDS

Jesus Anatol, Paris, France, assignor to Sucreries du Soissonnais et Compagnie Scuriere, Paris, France

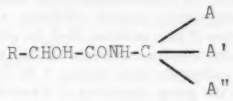
Filed Mar. 2, 1972, Ser. No. 231,381
Claims priority, application France, Mar. 2, 1971, 71.07097
Int. Cl.[2] C07D *59/33, 59/34, 65/20*
U.S. Cl. 260—406 13 Claims

1. A process for the preparation of an α-ketocarboxylic acid of the formula: R—CO—COOH, in which R is selected from the group consisting of aliphatic, benzyl, phenyl and aralkyl radicals, which consists essentially of the successive steps of

a. condensing in acid medium a secondary or tertiary alcohol of the formula

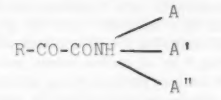


wherein A is selected from the group consisting of hydrogen, aliphatic, and aralkyl radicals, and A' and A'' are selected from the group consisting of aliphatic and aralkyl radicals, with a 2-hydroxy nitrile of the formula R-CHOH-CN in which R has the above meanings to form the corresponding α-hydroxy carboxamide of the formula



wherein R, A, A' and A'' have the above meanings,

b. oxidizing said α-hydroxy carboxamide with an oxidizing agent in solution to form an α-ketocarboxamide of the formula:



wherein A, A', A'' and R have the same meanings as above and further wherein said oxidizing agent is selected from the group consisting of chromium trioxide, manganese dioxide and permanganates; and

c. hydrolyzing said α-ketocarboxamide in an acid medium to form said α-ketocarboxylic acid.

3,897,468

POLYBASIC ACID COMPOSITIONS OBTAINED FROM POLYMERIZED FATTY ACIDS

Harold E. Mains, and Fred O. Barrett, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Feb. 15, 1974, Ser. No. 442,996
Int. Cl.[2] C08H *3/00*
U.S. Cl. 260—407 12 Claims

1. A process which comprises heating a polymerized fatty acid containing 50 percent by weight or more dimer acid and less than 5 percent by weight monobasic acid with 1 to 35 percent by weight, based on the polymerized fatty acid, of free radical initiator at a temperature between about 50°C and 190°C to increase the polybasic acid content of the mixture.

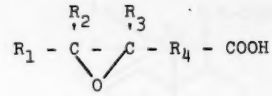
3,897,469

PROCESS FOR THE PRODUCTION OF DI- AND POLYHYDROXYCARBOXYLIC ACIDS

Werner Stein, Erkrath-Unterbach, and Rainer Osberghaus, Dusseldorf-Urdenbach, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Filed Nov. 7, 1973, Ser. No. 413,653
Claims priority, application Germany, Nov. 20, 1972, 2256908
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 12 Claims

1. In the process for the preparation of higher dihydroxycarboxylic acids and/or polyhydroxycarboxylic acids comprising hydrolyzing the corresponding epoxycarboxylic acids of the formula



wherein R_1, R_2, and R_3 are each selected from the group consisting of hydrogen, alkyl having 1 to 20 carbon atoms and epoxyalkyl having 3 to 20 carbon atoms, and wherein R_4 is selected from the group consisting of alkylene having 1 to 21 carbon atoms and epoxyalkylene having 3 to 21 carbon atoms, with the proviso that the epoxycarboxylic acids have a total of 6 to 24 carbon atoms, with a solution of a catalyst, and recovering said acids; the improvement which comprises carry-out said hydrolysis with a catalyst consisting essentially of an aqueous solution of salts selected from the group consisting of alkali metal salts, alkaline earth salts and the mixtures thereof, an aliphatic carboxylic acid having 1 to 24 carbon atoms selected from the group consisting of alkanoic acids having 1 to 10 carbon atoms, alkanedioic acids having 3 to 24 carbon atoms, alkenedioic acids having 4 to 24 carbon atoms, a mixture of an alkanoic acid having 1 to 24 carbon atoms with at least one carboxylic acid selected from the group consisting of alkanedioic acids having 3 to 24 carbon atoms and alkenedioic acids having 4 to 24 carbon atoms, and a mixture of a polyhydroxycarboxylic acid hydrolysis product with at least one carboxylic acid selected from the group consisting of alkanedioic acids having 3 to 24 carbon atoms and alkenedioic acids having 4 to 24 carbon atoms, said polyhydroxycarboxylic acid hydrolysis product being selected from the group consisting of dihydroxymonocarboxylic acids having 6 to 24 carbon atoms produced by said hydrolysis and polyhydroxymonocarboxylic acids having 6 to 24 carbon atoms produced by said hydrolysis, at a temperature above 100°C, said carboxylic acid salts being stable under the reaction conditions and being soluble in the form of their salts.

3,897,470

PROCESS FOR PRODUCING OIL-SOLUBLE METAL SULFONATES

Roy C. Sias, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Continuation of Ser. No. 148,264, May 5, 1971, abandoned. This application May 11, 1973, Ser. No. 359,302

Int. Cl. C07f *11/00, 1/00, 7/28*

U.S. Cl. 260—429 K **12 Claims**

1. A process for producing oil-soluble sulfonates containing metal constituents, which sulfonates have a long shelf life without precipitation of the metal constituents, comprising:

a. mixing at least a stoichiometric amount of a metal halide selected from the group consisting of aluminum, chromium, iron, molybdenum, vanadium, titanium, indium, niobium, tantalum, rubidium, osmium, and mixtures thereof, with water and an oil-soluble sulfonic acid having a molecular weight in the range of about 300 to about 1000 to form a reaction mixture,

b. agitating and heating said reaction mixture to a temperature in the range of 60° to 105°C,

c. introducing into the reaction mixture an additional amount of the oil-soluble sulfonic acid in an amount of from 50 to 200 weight percent based on the oil-soluble sulfonic acid already in the reaction mixture,

d. continuing the agitation and heating of the reaction mixture to the reflux temperature of said mixture for a period of time effective to allow formation of a metal sulfonate substantially free of said halide, and

e. recovering from the reaction product of step (d) the metal sulfonate.

3,897,471

PROCESS FOR PRODUCING METHANOL

Rolf Herbert, Cologne-Marienburg, and Helmut Liebgott, Bad Homburg, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 44,538, June 8, 1970, abandoned. This application Oct. 13, 1972, Ser. No. 297,521

Claims priority, application Germany, June 18, 1969, 1930702

Int. Cl. C07c *31/06*

U.S. Cl. 260—449.5 **6 Claims**

1. In the production of methanol by contacting a synthesis gas containing oxides of carbon and hydrogen with a catalyst at elevated temperature and pressure, the improvement which comprises employing a catalyst consisting essentially of copper and vanadium and one or both of zinc and manganese at a temperature of about 200°–300°C. and a pressure of about 20–100 kilograms per square centimeter above atmospheric pressure, the catalyst on an atomic percentage based on pure metals containing about 40–60% of copper, about 10–20% of vanadium, and about 20–50% of one or both of zinc and manganese, said catalyst having been prepared by precipitation of salts of the metals from a solution thereof followed by calcination.

3,897,472

POLYHALOGENATED POLYISOCYANATES

Ludovic Parvi, Pont-de-Claix, and Arsene Isard, Grenoble, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 13,844, Feb. 24, 1970, abandoned. This application Jan. 17, 1973, Ser. No. 324,351

Int. Cl. C07c *119/04*

U.S. Cl. 260—453 AR **3 Claims**

1. Isocyanates having the general formula

wherein Ar represents a polychlorinated aromatic hydrocarbon radical selected from the group of polychlorophenyl, polychlorobiphenyl, polychloroterphenyl, and polychloroquaterphenyl or a polybrominated aromatic hydrocarbon radical selected from the group of polybromophenyl, polybromobiphenyl, polybromoterphenyl, and polybromoquaterphenyl; Ar′ represents an aromatic hydrocarbon radical selected from the group of phenylene, toluylene, biphenylene, diphenylmethylene, and naphthylene, said radicals being unsubstituted or substituted with one or more chloro or bromo atoms; and *n* is equal to 2 or 3.

3,897,473

MERCAPTO AND SULFIDE CONTAINING DIENOIC THIOACID ESTERS

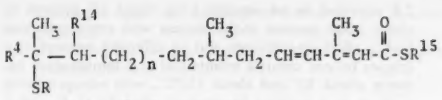
Clive A. Henrick, and John B. Siddall, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 256,605, May 24, 1972, Pat. No. 3,826,804, which is a continuation-in-part of Ser. No. 201,189, Nov. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 191,812, Oct. 22, 1971, abandoned. This application Oct. 9, 1973, Ser. No. 404,634

Int. Cl.² C07C *153/01*

U.S. Cl. 260—455 R **6 Claims**

1. A compound selected from the following formula:



wherein,

n is zero or the positive integer one;
R is hydrogen, methyl or ethyl;
R^4 is methyl or ethyl;
R^{14} is hydrogen or methyl; and
R^{15} is lower alkyl.

3,897,474

THIOL AND DITHIOL CARBAMATE ACID ESTER DERIVATIVES OF PHENYL FORMAMIDINE

Georg Pissiotas, Lorrach, Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

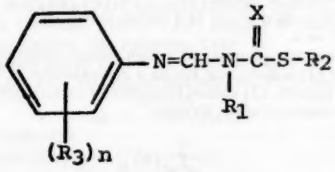
Filed Oct. 9, 1973, Ser. No. 404,467

Claims priority, application Switzerland, Oct. 12, 1972, 14964/72; July 31, 1973, 11055/73

Int. Cl.[2] C07C *155/02, 155/04*

U.S. Cl. 260—455 A **20 Claims**

1. A compound of the formula



wherein R_1 represents hydrogen, alkyl with 1 to 4 carbon atoms, alkenyl with 3 to 4 carbon atoms, alkinyl with 3 to 5 carbon atoms or unsubstituted benzyl, R_2 represents alkyl with 1 to 4 carbon atoms, alkenyl with 3 to 4 carbon atoms, alkinyl with 3 to 5 carbon atoms, alkoxyalkyl with 1 to 4 carbon atoms in each of the moieties, alkylthioalkyl with 1 to 4 carbon atoms in each of the moieties, unsubstituted benzyl or benzyl which is substituted by one or more chlorine atoms, $(R_3)_n$ represents one or more similar or different radicals, selected from the group consisting of hydrogen, fluorine, chlorine, bromine, methyl, trifluoromethyl, methoxy, methylthio, ethyl, ethoxy, ethylthio, chloroethyl, propyl, isopropyl, n-butyl, allyloxy, cyano, nitro, dimethylamino, or methoxycarbonyl, *n* is 1 to 3 and X represents oxygen or sulphur.

3,897,475

POLYHALOBENZONITRILE ALLYL ETHERS

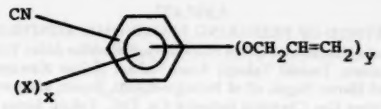
Lewis William Watts, Jr., Auston, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Dec. 8, 1971, Ser. No. 206,162

Int. Cl. C07c *121/74*

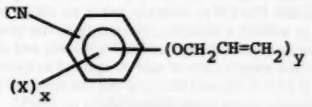
U.S. Cl. 260—465 F **6 Claims**

1. Compounds of the formula



wherein X is halogen, *x* is a number from 2 to 4, and *y* is a number from 1 to 3, provided that $x + y$ is 5.

5. A process for preparing polyhalobenzonitrile allyl ethers of the formula



wherein X is halogen, and *x* is a number from 2 to 4, and *y* is a number from 1 to 3, provided that $x + y$ is 5, which comprises reacting a pentahalobenzonitrile with a molar excess of allyl alcohol at a temperature of from about 20°C. to about 150°C. in the presence of a base selected from the group of alkali metal hydroxides, alkali metal hydrides and alkali metal amides, present in an amount such that there is from about 1 to about 8 moles of pentahalobenzonitrile per mole of said base.

3,897,476

SULFAMYLBENZOIC ACID DERIVATIVES

Peter Werner Feit, Gentofte, and Ole Bent Tvaermose Nielsen, Vanloss, both of Denmark, assignors to Leo Pharmaceutical Products Ltd., Ballerup, Denmark

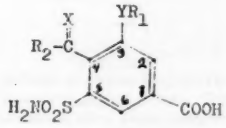
Filed Apr. 10, 1973, Ser. No. 349,826

Claims priority, application United Kingdom, Apr. 28, 1972, 19959/72; Nov. 16, 1972, 53043/72

Int. Cl. C07c *143/78*

U.S. Cl. 260—465 D **20 Claims**

1. A compound selected from the group of compounds of formulae I



I

in which

R_1 is selected from the group consisting of straight and branched C_1–C_6 alkyl, alkenyl and alkynyl radicals; said group further consisting of methyl and ethyl radicals monosubstituted with phenyl, halophenyl, trifluoromethylphenyl, lower alkoxyphenyl;

R_2 stands for a phenyl radical, optionally being substituted with a member selected from the group consisting of halogen, lower alkyl, hydroxy and lower alkoxy;

Y stands for a member selected from the group consisting of —O—, —S—, and —CH_2—;

X stands for a member selected from the group consisting of O and H_2;

and pharmaceutically acceptable, non-toxic salts of the carboxylic acid of formula I; and esters thereof with cyanomethanol, benzyl alcohol, and C_1–C_6 alcanols.

3,897,477
METHOD OF PREPARING DIAMINOMALEONITRILE

Yoshito Hamamoto; Hideo Shirakawa; Kazuhiko Aida; Yutaka Omura; Tosiaki Takagi; Kozo Nakao; Takuo Kawaguchi, and Haruo Nagai, all of Nakajyo-machi, Japan, assignors to Kyowa Gas Chemical Industry Co. Ltd., Tokyo, Japan

Filed Dec. 11, 1973, Ser. No. 423,768

Claims priority, application Japan, Dec. 19, 1972, 47-127904; Dec. 27, 1972, 48-51873; Dec. 27, 1972, 48-51873

Int. Cl. C07c *121/02*

U.S. Cl. 260—465.5 R **6 Claims**

1. A method of preparing diaminomaleonitrile which comprises polymerizing hydrogen cyanide in the presence of a compound selected from the group consisting of MeO, $Me(OH)_2$ and $Me(CN)_2$, wherein Me is an alkaline earth metal, using as solvent a member selected from the group consisting of n-methylpyrrolidone, dimethyl sulfoxide and dimethylformamide, the weight ratio of said compound to hydrogen cyanide being 0.01 – 1.00, and carrying out the reaction at a temperature ranging from room temperature to 150°C.

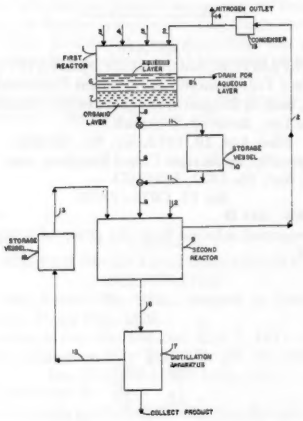
3,897,478
CONTINUOUS PROCESS FOR THE MANUFACTURE OF ALKYL CHRYSANTHEMATE ESTERS

Kyung S. Shim, and Donald J. Martin, both of Irvington, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

Filed May 21, 1970, Ser. No. 39,202

Int. Cl. C07c *67/00, 64/174*

U.S. Cl. 260—468 H **18 Claims**



1. A process for preparing C_1-C_{10} alkyl chrysanthemate esters which comprises:

a. continuously preparing in a first reaction zone a solution of a C_1-C_{10} alkyl diazoacetate in chlorinated solvent by the reaction, with agitation, of an aqueous mixture of an acid salt of a C_1C_{10} alkyl ester of glycine and an alkali metal nitrite in the presence of an effective concentration of an acid catalyst and said solvent, wherein said solvent is selected from the group consisting of C_1-C_2 chlorinated alkanes immiscible with and denser than said aqueous mixture, at a temperature less than about 20°C., said alkali metal nitrite provided in an amount from about 1 to about 40 percent molar excess with respect to said acid salt of the C_1-C_{10} alkyl ester of glycine;

b. continuously removing the solution of C_1-C_{10} alkyl diazoacetate in chlorinated solvent from the first reaction zone;

c. admixing and reacting in a second reaction zone, the solution of C_1-C_{10} alkyl diazoacetate in chlorinated solvent with a mixture containing 2,5-dimethyl-hexadiene-2,4 provided in an amount from about 10 percent to about 1000 percent molar excess with respect to said C_1-C_{10} alkyl diazoacetate and an effective amount of a copper bronze catalyst maintained at a temperature between about 50° and about 135°C., with nitrogen being evolved as a gaseous by-product whereby C_1-C_{10} alkyl chrysanthemate is produced;

d. recovering C_1-C_{10} alkyl chrysanthemate.

3,897,479
PROCESS FOR THE HALOGENATION OF ADAMANTANES

Yoshiaki Inamoto, Wakayama; Takeji Kadono, Kainan, and Naotake Takaishi, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

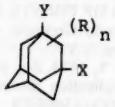
Filed Oct. 29, 1973, Ser. No. 410,508

Claims priority, application Japan, Oct. 30, 1972, 47-108602

Int. Cl. C07c *51/00, 79/12*

U.S. Cl. 260—468 G **5 Claims**

1. A method for preparing a compound of the formula



wherein

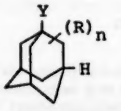
Y is H or a substituent having a Taft's polar substituent constant of not more than about +1.50,

X is chloro or bromo,

R is H or alkyl of one to 4 carbon atoms, and

n is 1 or 2,

which comprises forming a reaction mixture consisting essentially of (1) sulfuric acid having a concentration of 70 to 98 weight percent, (2) carbon tetrachloride or cyclohexane and (3) a compound of the formula



wherein Y, R and *n* are as defined above,

adding to said reaction mixture, at from 0° to 20°C, continuously or in increments over an extended period of time, (4) a compound of the formula MX, wherein X is as defined above and M is H, alkali metal, alkaline earth metal, boron or aluminum,

and simultaneously adding to said reaction mixture in increments over a period of time of at least about 10 minutes, (5) t-butanol, while vigorously stirring the reaction mixture,

the total amount of t-butanol (5) added to the reaction mixture over said time period of at least about 10 minutes being from 1 to 5 moles per 1 mole of compound (3), the amount of sulfuric acid (1) in the reaction mixture being from 10 to 80 parts by weight per one part by weight to t-butanol added to the reaction mixture, the amount of carbon tetrachloride or cyclohexane (2) in the reaction mixture being from 10 to 30 parts by weight per one part by weight of compound (3) and the amount of compound MX (4) added to the reaction mixture being from 5 to 20 moles per one mole of compound (3), the compound MX (4) being added at a rate relative to the rate of adding t-butanol, such that at least one equivalent of MX, per 1 mole of compound (3), shall have been added to the reaction mixture before completion of the addition of t-butanol (5) and the addition of compound MX (4) being

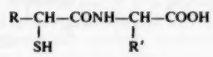
continued after the addition of t-butanol (5) is completed;
and recovering the compound of the first-named formula from the reaction product.

3,897,480
N-(MERCAPTOACYL)AMINOACIDS

Itaru Mita, Ashiya; Shigeo Okumura, Takarazuke; Shigeru Yamabe, Kobe; Yoshihiko Funae, Suita, and Junzo Matumoto, Osaka, all of Japan, assignors to Santen Pharmaceutical Co. Ltd., Osaka, Japan

Filed Sept. 20, 1973, Ser. No. 398,934
Claims priority, application Japan, Oct. 3, 1972, 47-100491; May 11, 1973, 48-52924
Int. Cl.² C07C *149/00*
U.S. Cl. 260—470 **6 Claims**

1. A compound represented by the formula



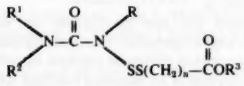
wherein when R is phenyl, benzyl or p-chlorophenyl, R′ is hydrogen and when R is methyl, R′ is phenyl or benzyl.

3,897,481
N-CARBALKOXYALKYLDITHIO UREAS

James D. Cleveland, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 250,895, May 8, 1972, Pat. No. 3,857,883. This application Nov. 30, 1973, Ser. No. 420,726
Int. Cl. C07c *149/42*
U.S. Cl. 260—470 **9 Claims**

1. A urea compound of the formula



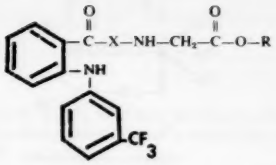
wherein R, R^1 and R^2 individually are hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 4 carbon atoms, mononuclear or binuclear aryl of 6 to 10 carbon atoms substituted with 1 to 4 fluoro, chloro, bromo, trifluoromethyl, trichloromethyl, nitro or alkoxy of 1 to 4 carbon atoms; R^3 is alkyl of 1 to 6 carbon atoms and *n* is 1 or 2, with the proviso that at least one R, R^1 or R^2 group is aryl.

3,897,482
NOVEL 2-(3-TRIFLUOROMETHYLANILINO)-BENZOIC ACID COMPOUNDS

Karl-Heinz Boltze, Bensberg-Kippekausen; Otfried Brendler; Hans-Dieter Dell, both of Cologne, and Haireddin Jacobi, Leichlingen, all of Germany, assignors to Troponwerke Dinklage & Company, Cologne, Germany

Filed Dec. 10, 1971, Ser. No. 206,923
Claims priority, application Germany, Dec. 16, 1970, 2061948
Int. Cl. C07c *103/30*
U.S. Cl. 260—472 **8 Claims**

1. Compound of the formula



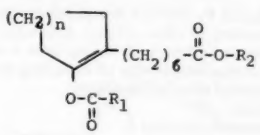
wherein X is —O—CH_2—CO— or a valence bond and R is hydrogen or lower alkyl of from one to four carbon atoms.

3,897,483
NOVEL 1-ACYLOXY-2-(OMEGA-CARBOALKOXYALKYL)CYCLOALK-1-ENES

Karel Francis Bernady; Middleton Brawner Floyd, Jr., both of Suffern; John Frank Poletto, Nanuet, all of N.Y.; Robert Eugene Schaub, Upper Saddle River, and Martin Joseph Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 7, 1971, Ser. No. 104,761
Int. Cl. C07c *69/14, 69/24*
U.S. Cl. 260—488 R **3 Claims**

1. Compounds of the formula:



wherein *n* is the integer 1 or 2, R_1 is alkyl having up to 4 carbon atoms, and R_2 is alkyl having up to 4 carbon atoms.

3,897,484
MONO-ALANINE MALEATE

Soichiro Asai, Kawasaki; Hideo Tazuke, Tokyo, and Hiroo Kageyama, Kamakura, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Mar. 30, 1972, Ser. No. 239,786
Int. Cl.² C07C *101/08*
U.S. Cl. 260—501.11 **1 Claim**

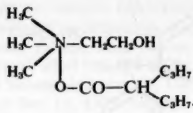
1. Mono-alanine maleate.

3,897,485
CHOLINE COMPOUNDS

Henry Eugene Jean-Marie Meunier, Grenoble, France, assignor to Laboratoires J. Berthier, Grenoble, France

Continuation of Ser. No. 587,413, Oct. 18, 1966, abandoned. This application June 30, 1971, Ser. No. 158,549
Int. Cl. C07c *87/30*
U.S. Cl. 260—501.15 **1 Claim**

1. Choline dipropylacetate, having the formula



3,897,486

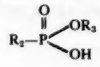
PURIFICATION OF ALIPHATIC PHOSPHONIC ACIDS

Albert M. V. Jacques, Norristown, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed June 28, 1974, Ser. No. 484,504
Int. Cl.[2] C07F 9/38
U.S. Cl. 260—502.4 R 16 Claims

1. A process for separating an aliphatic phosphonic acid, represented by the general formula:

from an aliphatic phosphonic acid half-ester, represented by the general formula:



wherein R_1, R_2 and R_3 are each independently selected from the group consisting of alkyl, alkenyl, halo-substituted alkyl and halo-substituted alkenyl, all having from 1 to 6 carbon atoms, which comprises the step of extracting the half-ester from a first aqueous mixture containing:

a. the half-ester;
b. the phosphonic acid; and
c. a quantity of sodium sulfate; with a halo-substituted alkyl of from one to eight carbon atoms to form a second aqueous mixture containing predominantly the phosphonic acid and all of the sodium sulfate.

3,897,487

PREPARATION OF 5-FLUORO-2-METHYL-1-(P-METHYLSULFINYLBENZYLIDENE) INDENYL-3-ACETIC ACID

Howard Jones, Holmdel, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 3, 1973, Ser. No. 402,944
Int. Cl. C07c 147/00
U.S. Cl. 260—515 A 4 Claims

1. A process for preparing 5-fluoro-2-methyl-1-(p-methylsulfinylbenzylidene)-3-indenyl acetic acid which comprises the steps of:

a. condensing 5-fluoro-2-methylindane-1,3-dione-3,3′-o-ethylene ketal with p-methylsulfinylbenzylmagnesium halide followed by dehydration or with p-methylsulfinylbenylidenetriphenylphosphorane to form 5-fluoro-2-methyl-1-(p-methylsulfinylbenzylidene)-indane-3,3′-o-ethylene ketal;
b. hydrolyzing said indane under aqueous acidic conditions to form 5-fluoro-2-methyl-1-(p-methylsulfinylbenzylidene)-indane-3-one;
c. condensing said indane-3-one compound with a malonic acid ester in the presence of a strong base to form the diester of 5-fluoro-2-methyl-1-(p-methylsulfinylbenzylidene)-3-indenyl malonic acid;
d. hydrolyzing said diester under aqueous acidic conditions to form the the indane-3-malonic acid; and
e. decarboxylating said indane-3-malonic acid by heating.

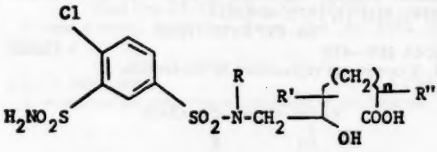
3,897,488

CHLOROBENZENE-2,4-DISULPHONIC ACID AMIDE CARBOXYLIC ACIDS

Harald Horstmann, Wuppertal-Vohwinkel; Hartmund Wollweber, and Karl Meng, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 62,639, Aug. 10, 1970, which is a division of Ser. No. 829,123, May 29, 1969, which is a division of Ser. No. 643,822, June 6, 1967, Pat. No. 3,499,005. This application Jan. 11, 1974, Ser. No. 432,744
Claims priority, application Germany, June 16, 1966, 4948712
Int. Cl. C07c 143/40
U.S. Cl. 260—519 1 Claim

1. A compound of the formula:



wherein:
R is hydrogen or methyl;
R′ is hydrogen or lower alkyl;
R″ is hydrogen or lower alkyl,
n is 0 or 1; and
pharmaceutically acceptable non-toxic salts thereof.

3,897,489

OXIDATION OF ISOBUTYLENE GLYCOL TO ALPHA HYDROXYISOBUTYRIC ACID

Ming N. Sheng, Cherry Hill, N.J., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 308,201, Nov. 20, 1972, abandoned. This application Apr. 29, 1974, Ser. No. 464,881
Int. Cl.[2] C07C 51/28, 59/04
U.S. Cl. 260—531 R 11 Claims

1. The method for the production of alpha-hydroxyisobutyric acid which comprises catalytically oxidizing in the presence of a supported platinum catalyst isobutylene glycol with molecular oxygen in an aqueous solution having a pH in the range of from about 2 to 7, ionizable metal compounds being absent from said solution.

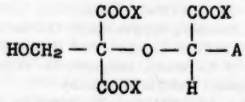
3,897,490

HYDROXY ETHER CARBOXYLATES

Kent P. Lannert, Freeburg, Ill., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 19, 1973, Ser. No. 426,297
Int. Cl. C07c 59/22
U.S. Cl. 260—535 P 7 Claims

1. Compounds represented by the formula



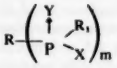
wherein X is selected from the group consisting of hydrogen, alkali metal, ammonium, alkyl and alkanol ammonium wherein the alkyl group contains from 1 to 4 carbon atoms, and alkyl groups containing from 1 to 20 carbon atoms and A is selected from the group consisting of hydrogen and methyl.

3,897,491
PROCESS FOR PREPARING ALKYL OR ARYL PHOSPHORUS HALIDES AND MIXED ISOMERS THEREOF

Arthur D. F. Toy, Stamford, Conn., and Eugene H. Uhing, Ridgewood, N.J., assignors to Stauffer Chemical Company, New York, N.Y.

Filed June 10, 1971, Ser. No. 151,955
Int. Cl. C07f 9/42
U.S. Cl. 260—543 P 51 Claims

1. A method for preparing compounds of the formula:



wherein R is a C_1 to C_{20} alkyl radical, cycloalkyl of 5–6 carbons in the ring, an aryl radical of up to 3 fused rings, and biphenyl, R_1 represents a C_1 to C_{20} alkyl radical, cycloalkyl of 5–6 carbons on the ring, an aryl radical of up to 3 fused rings, biphenyl, or a halogen of chlorine, or bromine, X is a halogen of chlorine or bromine, and Y is a chalcogen of oxygen or sulfur, and m is an integer between 1 and n, defined hereinafter, inclusive, comprising reacting, under at least an autogenous pressure at a temperature of from about 200°C. to about 450°C. an alkyl or aryl halide of the formula:

$$RX_n$$

wherein R is as defined above, and X is a halogen of chlorine, or bromine, and n is an integer and represents the number of haolgens attached to the R group, with a trivalent phosphorus compound of the formula

$$R_1P(X)_2$$

wherein R_1 and X are as defined above, in the presence of a phosphorus compound of the formula:

$$P_4Y_{10}$$

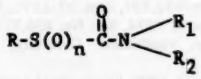
wherein Y is a chalcogen of oxygen or sulfur.

3,897,492
METHOD OF MAKING CARBAMOYL SULFOXIDE DERIVATIVES

Harry Tilles, El Cerrito, and Alan A. MacDonald, Albany, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

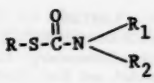
Continuation-in-part of Ser. No. 280,393, Aug. 14, 1972, abandoned. This application June 18, 1973, Ser. No. 371,329The portion of the term of this patent subsequent to July 22, 1992, has been disclaimed.
Int. Cl.[2] C07C 103/76, 147/14
U.S. Cl. 260—551 R 2 Claims

1. A process for manufacturing a compound having the formula:



wherein *n* is 1 or 2; R is selected from the group consisting of halophenyl, phenalkyl, substituted phenalkyl wherein said substituents are selected from halogen, alkyl having 1–6 carbon atoms and haloalkyl having 1 to 6 carbon atoms; R_1 and R_2 can be the same or different and are selected from lower alkyl having 1 to 6 carbon atoms, cyclohexyl, alkylcyclohexyl, alkenyl, alkynyl and benzyl, comprising the steps of:

a. reacting an oxidizing agent selected from peracetic acid and m-chloroperoxybenzoic acid with a thiocarbamate in the presence of an inert solvent; said thiocarbamate having the formula:



wherein said R, R_1 and R_2 have been previously defined.

b. said reaction being carried out at a temperature of between −25°C. and 65°C.;

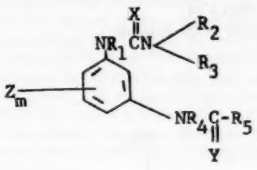
c. said oxidizing agent being present in an amount of at least one molar equivalent.

3,897,493
META-ANILIDE UREA COMPOSITIONS AND THEIR UTILITY AS HERBICIDES

Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 180,171, Sept. 13, 1971, Pat. No. 3,816,498, which is a division of Ser. No. 23,021, March 26, 1970, Pat. No. 3,642,891, which is a continuation-in-part of Ser. No. 746,007, July 19, 1968, abandoned, which is a continuation-in-part of Ser. No. 662,573, Aug. 23, 1967, abandoned. This application Feb. 22, 1974, Ser. No. 444,630
Int. Cl. C07c 127/18, 157/08
U.S. Cl. 260—553 A 17 Claims

1. A compound having the formula



in which X and Y are oxygen; R_1 is hydrogen; R_2 is hydrogen or alkyl of 1 to 10 carbon atoms, R_3 is cycloalkyl having from 3 to 6 carbon atoms, inclusive, alkyl of 1 to 10 carbon atoms, or lower alkenyl of 2 to 4 carbon atoms, R_4 is hydrogen; R_5 is selected from the group hydrogen, alkyl of 1 to 10 carbon atoms, halogenated lower alkyl of 1 to 6 carbon atoms, provided that when R_1, R_2, R_3 and R_4 are hydrogen, X and Y are oxygen and *m* is 0, then R_5 is other than methyl or ethyl.

3,897,494
AMINOACID DERIVATIVES

Boris Vasilev Alexiev; Stoycho Borisov Stoev; Alexander Vasilev Spasov; Lilyana Stoilova Maneva; Emanuil Alexandrov Emanuilov, and Evgeni Victorov Golovinski, all of Sofia, Bulgaria, assignors to Institute po Biochimia pri Ban, Sofia, Bulgaria

Filed Sept. 26, 1973, Ser. No. 400,795
Claims priority, application Bulgaria, Sept. 26, 1972, 21479
Int. Cl. C07c 103/30
U.S. Cl. 260—561 H 1 Claim

1. L-cystine-bis-(N,N-B-Chlorethylhydrazide).

3,897,495

PERHALOGEN-2-AZAPROPENES PROCESS

Erich Klauke, Odenthal-Hahnenberg; Hans Holtschmidt, Leverkusen-Steinbuechel, and Kurt Findeisen, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 6, 1972, Ser. No. 215,907

Claims priority, application Germany, Jan. 12, 1971, 2101107

Int. Cl. C07c *119/00*

U.S. Cl. 260—566 D 5 Claims

1. Process for preparing perflouro-2-azapropene which comprises reacting trichloromethyl isocyanide dichloride with at least the stoichiometrically necessary quantity of sodium fluoride in an organic solvent at a temperature of from 80° to 220°C.

3,897,496

N,N-DIALKYL-N-C8–C22-ALKYL)-N-3-NITRO-4-METHOXYBENZYLAMMONIUM CHLORIDES

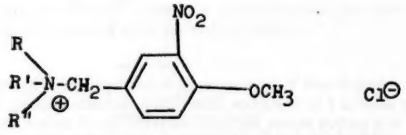
Nathan N. Crounse; Simon Bonta, and Charles J. Ploss, all of Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 77,707, Oct. 2, 1970, abandoned. This application Aug. 24, 1973, Ser. No. 391,451The portion of the term of this patent subsequent to Oct. 6, 1987, has been disclaimed.

Int. Cl. C07c *87/00*

U.S. Cl. 260—567.6 M 3 Claims

1. A compound of the formula



wherein R is alkyl having 1 to 22 carbon atoms; R′ is lower alkyl; and R″ is higher-alkyl having 8 to 22 carbon atoms.

3,897,497

POLYAMIDE-IMIDES

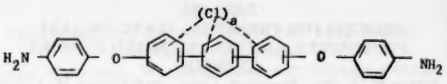
George Lewis Brode, Somerville, and James Hajime Kawakami, Piscataway, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 182,526, Sept. 21, 1971, Pat. No. 3,817,921, which is a continuation-in-part of Ser. No. 50,968, June 29, 1970, abandoned. This application Apr. 1, 1974, Ser. No. 456,805

Int. Cl. C07c *93/06*

U.S. Cl. 260—571 4 Claims

1. An amine having the formula:



wherein *a* is an integer having values of 6 to 8.

3,897,498

PRODUCTION OF M- AND P-PHENYLENEDIAMINE

Hans-Georg Zengel, Kleinwallstadt, and Manfred Bergfeld, Erlenbach, both of Germany, assignors to Akzo N. V., Arnhem, Netherlands

Filed Mar. 13, 1974, Ser. No. 450,675

Claims priority, application Germany, Mar. 19, 1973, 2313496

Int. Cl. C07c *87/58*

U.S. Cl. 260—578 10 Claims

1. A process for the production of m-phenylenediamine or p-phenylenediamine from the corresponding isophthalamide or terephthalamide as the initial phthalamide reactant, which process comprises:

reacting chlorine with said phthalamide reactant suspended in water in a first stage while maintaining the resulting reaction mixture over the course of the reaction in said first stage as a dilute aqueous solution of a mineral acid, the dilution being such that hydrogen chloride being formed by the chlorination reaction remains substantially completely dissolved in the reaction mixture; and

converting the resulting N,N′-dichloro-isophthalamide or N,N′-dichloro-terephthalamide of said first stage into the corresponding m-phenylenediamine or p-phenylenediamine by reaction with an aqueous solution of an alkali or alkaline earth metal hydroxide in a second stage.

3,897,499

HYDROGENATION OF CHLORONITROBENZENES USING NOBLE METAL CATALYSTS TREATED WITH A SULFOXIDE AND A HYDRAZINE

Gerhard Vollheim, Hanau; Karl-Jurgen Troger, Grossauheim, and Gerhard Lippert, Kleinostheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Germany

Division of Ser. No. 292,797, Sept. 27, 1972. This application Jan. 4, 1974, Ser. No. 430,773

Claims priority, application Germany, Oct. 8, 1971, 2150220

Int. Cl. C07c *85/10*; B01j *11/08*

U.S. Cl. 260—580 16 Claims

1. A process of selectively hydrogenating chloronitrobenzene or chloronitrobenzene substituted on the benzene ring with lower alkyl to chloroaminobenzene or chloroaminobenzene substituted on the ring with lower alkyl comprising hydrogenating said chloronitrobenzene or chloronitrobenzene having a lower alkyl substituent on the benzene ring using as a catalyst for said hydrogen a noble metal selected from the group consisting of platinum and palladium on activated carbon, said catalyst having been prepared by treating said noble metal on activated carbon with a sulfoxide of the formula R_1SOR_2 where R_1 and R_2 are alkyl, aralkyl or aryl and then

with a hydrazine material having the formula R_3NHNH_2 where R_3 is hydrogen, alkyl, aryl, aralkyl or alkenyl.

3,897,500

ALKYLIDENEDITHIOBISPHENOLS

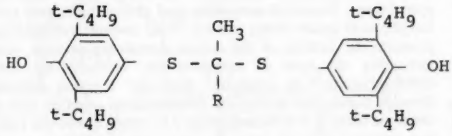
Martin B. Neuworth, Trumbull, Conn., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 206,929, Dec. 10, 1971. Pat. No. 3,786,100, which is a division of Ser. No. 835,811, June 23, 1969, abandoned, which is a continuation-in-part of Ser. Nos. 637,622, May 11, 1967, abandoned, Ser. No. 637,649, May 11, 1967, abandoned, and Ser. No. 637,650, May 11, 1967, abandoned. This application May 29, 1973, Ser. No. 367,055

Int. Cl. C07c *149/36*

U.S. Cl. 260—609 F 3 Claims

1. A compound having the general formula



where R is an alkyl radical containing 4 or 6 carbon atoms.

3,897,501

HYDROPEROXIDES

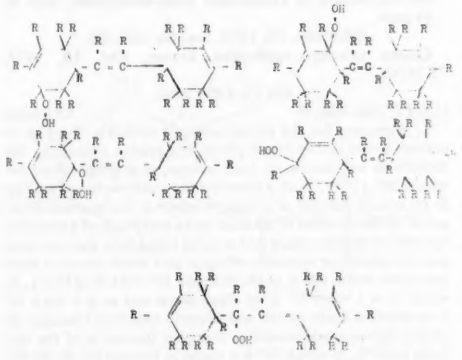
Paul W. Solomon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 714,070, March 18, 1968, Pat. No. 3,763,240, which is a continuation-in-part of Ser. No. 509,624, Nov. 24, 1965, abandoned. This application Apr. 24, 1973, Ser. No. 354,094

Int. Cl. C07c *73/06*

U.S. Cl. 260—610 R 4 Claims

1. Hydroperoxides characterized by the following formulas:



wherein R is selected from the group consisting of hydrogen, methyl and ethyl and wherein the total number of carbon atoms in all of said R groups does not exceed eight.

3,897,502

PROCESS FOR MAKING FLUORINATED ETHERS

James P. Russell, Berkeley Heights; Alex J. Szur, North Plainfield, and Ross C. Terrell, Plainfield, all of N.J., assignors to Airco, Inc., Montvale, N.J.

Continuation of Ser. No. 191,811, Oct. 22, 1971, abandoned. This application Aug. 23, 1973, Ser. No. 390,690

Int. Cl. C07c *41/00*

U.S. Cl. 260—614 F 12 Claims

1. A method for partially fluorinating a polyfluoroether feedstock selected from the group consisting of dimethyl dioxalane and a standard alkane containing from 2 to about 16 carbon atoms, said polyfluoroether feedstock having at least two fluorine atoms, at least two hydrogen atoms and one or two ether oxygen atoms per molecule and having as many halogen atoms of atomic number 9 to 35 as carbon atoms in the molecule, the ratio of halogen atoms to carbon atoms in the molecule of the polyfluoroether feedstock being no more than 2:1, said method being selective toward the production of a further fluorinated polyfluoroether having at least one hydrogen atom and the same carbon skeletal structure in its molecule as said polyfluoroether feedstock, comprising contacting said polyfluoroether feedstock with a mixture of molecular fluorine and inert gas in a reaction zone under reaction conditions at which the polyfluoroether feedstock is in the liquid phase, the amount of inert gas in said mixture being sufficient to moderate the reaction so that it is controllable and the mixture contains about 5 to 75 volume percent molecular fluorine based on the total fluorine and inert gas charged to the reaction zone, the reaction temperature being in the range of about −40° to 0° C., to prepare a further fluorinated polyfluoroether product having at least one hydrogen atom and the same carbon skeleton in its molecule as said polyfluoroether feedstock.

3,897,503

GLYOXAL HEMIACETALS, THEIR PREPARATION AND USE

Richard Wessendorf, Essen-Heisingen, and Wilhelm Heitmann, Herne, both of Germany, assignors to Veba-Chemie AG, Wanne Eickel, Germany

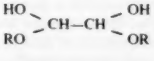
Filed Nov. 29, 1972, Ser. No. 310,491

Claims priority, application Germany, Dec. 3, 1971, 2159975

Int. Cl. C07c *43/30*

U.S. Cl. 260—615 A 5 Claims

1. A glyoxal hemiacetal of the formula



wherein each R is an alkyl radical of 4 to about 36 carbon atoms.

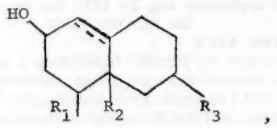
3,897,504

NOVEL NOREREMOPHILANE DERIVATIVES

Giuliano Bozzato, Küsnacht; Mario Pesaro, Zurich; Peter Schudel, Wetzikon; Marianne Hug-Inderbitzin, Schwerzenbach, all of Switzerland, and Robert Edward Erickson, Westfield, N.J., assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 111,736, Feb. 1, 1971, Pat. No. 3,819,711.
This application Sept. 21, 1973, Ser. No. 399,594
Claims priority, application Switzerland, Feb. 19, 1970, 2394/70
Int. Cl. C07c *35/22*
U.S. Cl. 260—617 F 3 Claims

1. A compound of the formula



wherein R_1 and R_2 signify hydrogen or methyl, but at least one of the symbols R_1 or R_2 signifies hydrogen and R_3 is isopropyl, isopropenyl or isopropylidene and the symbol represents a C—C single bond or a C=C double bond.

3,897,505

1,1,3,4,4,4-HEXACHLORO-1,2-BUTADIENE AND ITS DIMER

David G. Walker, Baytown, and Norman L. Ruland, Conroe, both of Tex., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Jan. 22, 1973, Ser. No. 325,823
Int. Cl. C07c *17/06, 21/20*
U.S. Cl. 260—648 R 19 Claims

1. 1,1,3,4,4,4-Hexachloro-1,2-butadiene.

3,897,506

PROCESS FOR THE PRODUCTION OF FREON

Kang Yang; Gaylord G. Greenfield, both of Ponca City, Okla., and Joseph D. Henry, Jr., Morgantown, W. Va., assignors to Continental Oil Company, Ponca City, Okla.

Filed May 7, 1973, Ser. No. 357,751
Int. Cl. C07c *17/20*
U.S. Cl. 260—653.7 3 Claims

1. A method for the production of freons comprising, in combination, the steps of:

a. reacting aqueous fluosilicic acid with ammonia to produce ammonium fluoride and silicon dioxide,

b. recovering said ammonium fluoride and reacting it with hydrogen fluoride and sodium nitrate to produce ammonium nitrate and sodium bifluoride,

c. recovering said sodium bifluoride and reacting it with hydrogen chloride to produce hydrogen fluoride and sodium chloride, wherein a portion of said hydrogen fluoride is recycled for utilization in step (b),

d. recovering the remainder of said hydrogen fluoride and reacting it with carbontetrachloride to produce hydrogen chloride and freon, wherein said hydrogen chloride is recycled for utilization in step (c),

e. separately recovering said freon.

3,897,507

METHOD FOR PRODUCING 3,4-DICHLOROBUTENE-1

Takeshi Yamahara, Kobe; Hiroshi Kishimoto, Takatsuki; Shinji Nakamura, Ibaraki, and Takashi Deguchi, Takatsuki, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 762,950, Sept. 26, 1968, abandoned.
This application Feb. 3, 1972, Ser. No. 223,298
Claims priority, application Japan, Jan. 24, 1968, 43-4493
Int. Cl. C07c *21/04*
U.S. Cl. 260—654 R 2 Claims

1. In a process for isomerizing 1,4-dichlorobutene-2 to produce 3,4-dichlorobutene-1 in the presence of a copper-containing catalyst selected from the group consisting of copper chloride, copper bromide, copper carbonate, copper thiocyanate, copper nitrate, copper actate, copper naphthenate, copper oxide and copper metal, the improvement which comprises carrying out the isomerization by heating at a temperature ranging from 90°–120°C., a mixture of said 1,4-dichlorobutene-2 and said copper-containing catalyst with a carboxylic acid amide selected from the group consisting of formamide, dimethylformamide, N-methyl-α-pyrrolidone, α-pyrrolidone, N-methyl acetamide and phthalimide, said carboxylic acid amide being present in an amount sufficient to promote the activity of the copper-containing catalyst, thus increasing the rate of isomerization, whereby the 3,4-dichlorobutene-1 is separated from the reaction mixture through distillation during the isomerization reaction and at the same time, 1,4-dichlorobutene-2 is supplied into the reaction mixture so as to keep the composition of the reaction mixture uniform, said carboxylic acid amide being present in an amount ranging from 0.5–10.0 percent by weight, based on the weight of the 1,4-dichlorobutene-2.

3,897,508

DIOLEFIN DIMERIZATION

Igor Tkatchenko, Pau, France, assignor to Union Chimique Elf-Aquitaine, Courbevoie and Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, both of, France

Filed Oct. 10, 1973, Ser. No. 404,889
Claims priority, application France, Oct. 10, 1972, 72.35765
Int. Cl. C07c *3/00*
U.S. Cl. 260—666 B 13 Claims

1. A process for the dimerization of diolefins of up to 10 carbon atoms in the liquid phase comprising contacting the diolefin in solution in an inert solvent at a temperature between 20°–120° C. with a dimerization catalytic amount of up to 10 mmole percent of a catalyst which is the reaction product of an alkali metal or alkaline earth metal salt of a tricarbonyl nitrosyl ferrate anion and a metal halogen or pseudo-halogen compound or complex, wherein said alkali metal or alkaline earth metal salt is of the formula $M^1[Fe(CO)_3(NO)]_m$ in which m is 1 when M^1 is an alkali metal and m is 2 when M^1 is an alkaline earth metal, and wherein said metal halogen or pseudo-halogen compound or complex thereof is of the formula $L_pM^2X_n$ in which M^2 is a metal of Groups IA, II, III, IV, V, VIB, VIIB or VIII of the Periodic Table, X is halogen, cyanide, sulfocyanide, isocyanate, nitrate, nitrite, sulfate, acetylacetonate, or carboxylate, L is a chalcogen or pnicogen ligand, p is an integer of 0–6 and n is an integer of 1–6.

3,897,509

PREPARATION OF ALKYLIDENE BICYCLIC COMPOUNDS

Tsuneyuki Nagase; Gohu Suzukamo; Masami Fukao, and Kenichi Nishio, all of Osaka, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

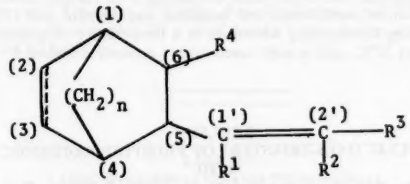
Continuation-in-part of Ser. No. 159,308, July 2, 1971, Pat. No. 3,808,152. This application Jan. 21, 1974, Ser. No. 434,996

Claims priority, application Japan, July 2, 1970, 45-58522; Aug. 18, 1970, 45-72643; June 5, 1971, 46-39701

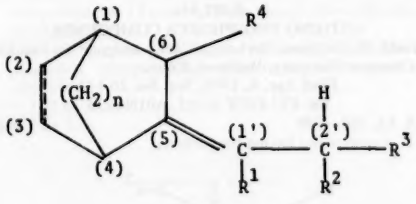
Int. Cl. C07c *5/24*

U.S. Cl. 260—666 PY 9 Claims

1. A process for the production of alkylidene bridged ring compounds which comprises contacting an alkenyl bridged ring compound of the formula:



wherein R^1, R^2 and R^3 are each hydrogen or alkyl having 1 to 8 carbon atoms, R^4 is hydrogen or alkyl having 1 to 4 carbon atoms and n is 1 or 2 and wherein a double bond may be present at the place between the 2- and 3-positions as indicated by the dotted line, with an alkaline catalyst composition prepared by heating alumina, from 0.01 to 100% by weight of the alumina of an alkali metal hydroxide and an equimolar or less amount with respect to the alkali metal hydroxide of an alkali metal at a temperature higher than the melting point of the alkali metal, whereby the resulting catalyst composition does not contain the alkali metal as a simple substance and consequently does not ignite on exposure to air and does not generate hydrogen on admixture with water, to give an alkylidene bridged ring compound of the formula:



wherein R^1, R^2, R^3, R^4 and n are each as defined above and wherein a double bond may be present at the place between the 2- and 3- positions as indicated by the dotted line.

3,897,510

PROCESS FOR THE PRODUCTION OF 5-ALKYLIDENENORBORNENE-2

Takashi Kiyota, Yokohama, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1973, Ser. No. 423,928

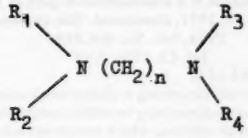
Claims priority, application Japan, Dec. 12, 1972, 47-124602

Int. Cl. C07c *13/28*

U.S. Cl. 260—666 PY 13 Claims

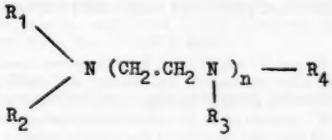
1. In a process for the production of a 5-alkylidenenorbornene-2 by the isomerisation of the corresponding 5-alkenylnorbornene-2 in the presence of a catalyst formed by combining an organo-alkali metal compound with a complexing agent selected from the group consisting of

a. substituted polymethylene diamines of the general formula :



where n is two or a greater integer, and R_1, R_2, R_3 and R_4 are alkyl, cycloalkyl or aryl radicals and may be the same or different;

b. substituted polyethylene diamines of the general formula



where n is two or a greater integer and R_1, R_2, R_3 and R_4 are alkyl, cycloalkyl or aryl radicals and may be the same or different; and

c. triethylene diamine; said process including the steps of decomposing catalyst contained in the product mixture by the addition of water, optionally containing in solution at least one substance selected from the group consisting of alkali metal hydroxides, carbonates and bicarbonates, in an amount greater than 1 mol equivalent of alkali metal compound contained in said product mixture and such that at least one alkali metal compound is present in the aqueous phase formed in a concentration greater than 5 percent by weight, and thereafter removing the catalyst decomposition products.

3,897,511

REMOVAL OF α-ACETYLENES FROM GAS STREAMS

Ludo K. Frevel, Midland, and Leonard J. Kressley, Saginaw, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 12, 1973, Ser. No. 415,457

Int. Cl. C07c *11/02*

U.S. Cl. 260—681.5 4 Claims

1. A method of removing alphaacetylenes from a gas stream containing the same, said gas stream consisting of one or more hydrocarbons, the inert gases helium, argon and minor proportions of CO and α-acetylenes and being substantially free of hydrogen which comprises contacting said gas stream with a supported catalyst consisting essentially of a mixture of finely divided copper metal and a minor proportion of at least one polyvalent activator metal, said activator metal being one

of the group of silver, platinum, palladium, manganese, nickel, cobalt, chromium and molybdenum, the weight of the activator metal or metals being from 1 to 20 percent of the combined weight of copper and activator, supported on gamma-alumina having a surface area of at least 10 square meters per gram and containing about 0.1 to 1.5 percent by weight of Na_2O, said supported catalyst having been oxidized and reduced before use, said contacting being carried out at between about 40° and 250°C.

3,897,512
OLEFIN DIMERIZATION PROCESS

Melvin Brown, Akron; Henry R. Menapace, Stow, and Neil A. Maly, Tallmadge, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 286,477, Sept. 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 125,408, March 17, 1971, abandoned. This application Oct. 9, 1973, Ser. No. 404,559
Int. Cl. C07c *3/10*
U.S. Cl. 260—683.15 D **8 Claims**

1. The method for dimerizing α-olefins containing from 3 to 8 carbon atoms or codimerizing α-olefins containing from 3 to 8 carbon atoms with ethylene which comprises subjecting said olefins to a catalyst consisting essentially of a mixture of (1) a tungsten salt selected from the group consisting of tungsten hexahalides and tungsten oxyhalides, (2) a reducing agent selected from the group defined by the formulae

$$R_nMX_{3-n} \text{ and } Al_{1.5}MX_{1.5}$$

wherein n is 1 or 2, X is a halogen, R is an alkyl radical containing from 1 to 10 carbon atoms and M is selected from boron, aluminum, gallium and indium and (3) a ligand of the formula

$$NR'R''R'''$$

wherein R′ and R″ are selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, alkenyl and alkaryl; R‴ is selected from the group of hydrogen, alkyl and alkenyl and R′, R″ and R‴ contain up to 20 carbon atoms and can be substituted by at least one member of the group consisting of halogen, amino, nitro, cyano, alkoxy, carboxy and carboalkoxy or R″ and R‴ join together by carbon-carbon bonds to form a heterocyclic saturated ring, in which the molar ratio of the ligand of (3) to the tungsten salt of (1) is from about 1.5/1 to about 2.5/1 and the molar ratio of the reducing agent of (2) to the tungsten salt of (1) is from about 8/1 to about 30/1.

3,897,513
PIVALOLACTONE RANDOM GRAFT COPOLYMERS

Sherman A. Sundet, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 166,281, July 26, 1971, abandoned. This application June 30, 1972, Ser. No. 268,056
Int. Cl. C08f *35/06, 27/12*
U.S. Cl. 260—824 R **40 Claims**

1. A thermoplastic random organic graft copolymer formed by contacting

an amorphous base polymer having thereon at least one random carboxylic group anionic site selected from the group consisting of free carboxylic sites and developable carboxylic sites

with up to 150% by weight of the polymer, of at least one α-substituted-β-propiolactone in an amount such that the ratio of the moles of β-lactone to the moles of anionic sites on the base polymer varies between 3 to 1000, and polymerizing said β-lactone to form crystallizable poyler sidechains, said sidechains having a length of between 3 to 1000 monomer units and a weight of up to 60 percent of the graft composition,

said base polymer characterized in that it is amorphous to x-rays at a temperature of 130°C or below, and has a molecular weight of about 2,000.

3,897,514
CURING HYDROXY-TERMINATED PREPOLYMER USING ANHYDRIDE/EPOXIDE CURING SYSTEM

John C. Allabashi, Cumberland, Md., assignor to Hercules Incorporated, Wilmington, Del.

Filed July 9, 1973, Ser. No. 377,859
Int. Cl. C08g *30/12*
U.S. Cl. 260—836 **10 Claims**

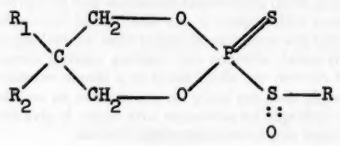
1. A process for curing hydroxy-terminated prepolymer comprising (a) admixing a hydroxy-terminated prepolymer having an equivalent molecular weight of from about 2,000 to about 4,000, based on hydroxyl content, and a hydroxyl functionality of from about 2.2 to about 2.6; a curing system comprising a cyclic anhydride and an epoxide, said cyclic anhydride and epoxide being mutually soluble in said hydroxy-terminated prepolymer and the equivalence ratio of said hydroxy-terminated prepolymer to cyclic anhydride to epoxide being from about 1.0 to about 0.8–1.2 to about 0.8–1.2 respectively; and a curing catalyst selected from chromium salts of aliphatic carboxylic acids containing 2–22 carbon atoms, chromium naphthenate and vanadium naphthenate; and (b) heating the resulting admixture at a temperature of at least about 30°C. until a solid cured rubber product is obtained.

3,897,515
CYCLIC O,O,S-TRIESTERS OF PHOSPHORODITHIOIC ACID

Walter Nudenberg, Newtown, Conn.; Merlin P. Harvey, Denison, Iowa, and James Urquhart Mann, Wayne, N.J., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 282,640, Aug. 21, 1972, which is a division of Ser. No. 66,870, Aug. 25, 1970, Pat. No. 3,712,878. This application July 17, 1974, Ser. No. 489,295
Int. Cl. C07d *105/04*
U.S. Cl. 260—934 **3 Claims**

1. A compound having the following formula:



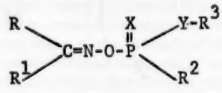
wherein R_1 and R_2 are C_1 to C_5 alkyl groups which can be the same or different; the O portion represents the optional presence of an oxygen atom; and R is α-hydroxyphenethyl.

3,897,516
OXIMINO PHOSPHORUS COMPOUNDS

Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

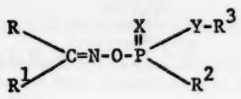
Filed Apr. 6, 1970, Ser. No. 26,103
Int. Cl.² C07F *9/165;* **A01N** *9/36*
U.S. Cl. 260—940 **6 Claims**

1. A compound having the formula



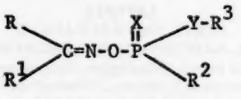
in which X is sulfur, Y is oxygen, R is alkyl having 1 to 4 carbon atoms, R^1 is methyl, R^2 is alkyl having 1 to 2 carbon atoms, and R^3 is 4-cyanophenyl.

3. A compound having the formula



in which X is sulfur, Y is oxygen, R is alkyl having 1 to 4 carbon atoms, R^1 is methyl, R^2 is alkyl having 1 to 2 carbon atoms, and R^3 is 2,4,5-trichlorophenyl

5. A compound having the formula



in which X is sulfur, Y is sulfur, R is alkyl having 1 to 4 carbon atoms, R^1 is methyl, R^2 is alkyl having 1 to 2 carbon atoms, and R^3 is phenyl.

3,897,517

(THIO)PHOSPHORYL-AND PHOSPHONYL FORMAMIDINES

Jurgen Hocker, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

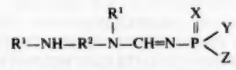
Filed Sept. 14, 1973, Ser. No. 397,552

Claims priority, application Germany, Sept. 23, 1972, 2246890

Int. Cl. A01n *9/36*; **C07f** *9/24*, *9/44*

U.S. Cl. 260—941 **8 Claims**

1. A (thio)phosphoryl- or (thio)phosphonyl formamidine of the formula



wherein

X is O or S,

Y and Z each independently is OR or SR, or one of them is R,

R is alkyl with up to about 16 carbon atoms, cycloalkyl with about 5 to 12 carbon atoms, phenyl, isopropoxycarbonylphenyl, or phenalkyl with up to 6 carbon atoms in the alkyl group,

R^1 is alkyl with up to about 16 carbon atoms, cycloalkyl with about 5 to 12 carbon atoms, phenyl, chlorophenyl or methoxyphenyl,

R^2 is $-C_nH_{2n}-$ or $-(C_pH_{2p-2})-$ optionally substituted by C_{1-4} alkyl, chlorine, NO_2 or CN, or is cyclohexylene or phenylene,

n is 1, 2 or 3, and

p is 2 or 3.

3,897,518

α-(DIBENZYLPHOSPHONO)ACETIC ACIDS

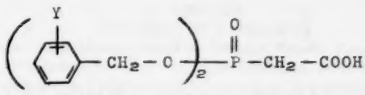
Gary A. Koppel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 28, 1974, Ser. No. 446,868

Int. Cl.² **C07C** *51/00*; **C07F** *9/40*

U.S. Cl. 260—941 **2 Claims**

1. An α-phosphonoacetic acid of the formula



in which Y represents a substituent in the ortho- or paraposition and is selected from the group consisting of hydrogen, methyl, methoxy, halo, and nitro.

3,897,519

SECONDARY PHOSPHORIC ACID ESTERS

Knut Bertil Hogberg; Hans Jacob Fex, both of Helsingborg; Bo Goran Fredholm, Nyhamnslage; Torsten Rune Perklev, and Sten Gunnar Veige, both of Helsingborg, all of Sweden, assignors to Aktiebolaget Leo, Helsingborg, Sweden

Division of Ser. No. 215,617, Jan. 5, 1972, Pat. No. 3,862,270.

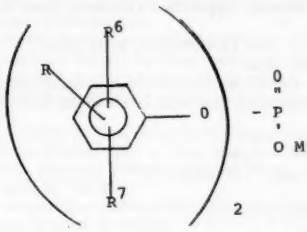
This application June 5, 1974, Ser. No. 476,663

Claims priority, application United Kingdom, Aug. 17, 1971, 38619/71; Nov. 10, 1971, 52303/71

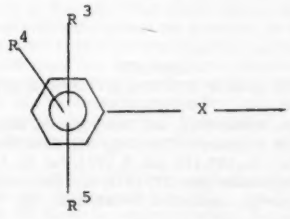
Int. Cl. C07f *9/18*

U.S. Cl. 260—942 **34 Claims**

1. A symmetrical secondary phosphoric acid ester compound of the general formula



wherein R is positioned in m- or p-position relative to the phosphoric acid ester group and is



wherein X is selected from the group consisting of

wherein Y is a straight hydrocarbon chain having 2 or 3 carbon atoms, said chain being saturated or containing one double bond and having at most 2 substituents selected from the group consisting of lower aklyl, phenyl, phenyl substituted in p-position by lower alkyl, lower alkoxy or halogen (F, Cl, Br), benzyl and benzyl substituted in p-position by lower alkyl, lower alkoxy or halogen (F, Cl, Br); R^3, R^4, R^5, R^6, and R^7 are same or different and are selected from the group consisting of-hydrogen, lower alkyl, lower alkoxy, hydroxy, $OCOR^8$, F, Cl, Br, CF_3, NO_2, $COOR^9$, Ch_2COOR^9, OCH_2COOR^9, $CONR_2^8$, $CH_2CONR_2^8$, $OCH_2CONR_2^8$, NR^8COR^8, $CH_2NR_2^8$ and $CH_2NR^8COR^8$, wherein R_8 is selected from the group consisting of hydrogen and lower alkyl, and wherein R^9 is selected from the group consisting of hydrogen, lower alkyl and M, where M is selected from the group consisting of H, Na, K,½ Ca and aa pharmaceutically acceptable amine with the proviso that one of said substituents R^3-R^7 is selected from the group consisting of $COOR^9$, CH_2COOR^9, OCH_2COOR^9, $CONR_2^8$, $CH_2CONR_2^8$ and OCH_2CONr_28, or selected from the group consisting of NR_2^8, NR^8COR^8, $CH_2NR_2^8$, and $CH_2NR^8COR^8$, wherein R^8 and R^9 have the above meaning.

3,897,520

O-ALKYL-N-MONO-ALKYL-S-(AMIDOCARBONYL)-METHYL-MONOTHIOPHOSPHORIC ACID ESTER AMIDES

Claus Stolzer, Wuppertal; Ingeborg Hammann, Cologne, and Gunter Unterstenhofer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

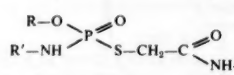
Filed June 13, 1973, Ser. No. 369,688

Claims priority, application Germany, June 27, 1972, 2231412

Int. Cl. C07f 9/24; A01n 9/36

U.S. Cl. 260—943 **6 Claims**

1. An O-alkyl-N-mono-alkyl-S-(amidocarbonyl)-methyl-monothiophosphoric acid ester amide of the formula



(I)

in which

R, R′ and R″ each independently is alkyl of 1 to 6 carbon atoms.

3,897,521

S,S-DIALKYL-O-ALKYLTHIOALKYL PHOSPHITES AND PHOSPHATES

Ernst Beriger, Neuallschwil, and Henry Martin, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

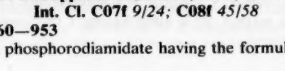
Division of Ser. No. 105,125, Jan. 8, 1971, Pat. No. 3,760,042. This application June 27, 1973, Ser. No. 374,219

Claims priority, application Switzerland, Jan. 16, 1970, 595/70

Int. Cl. C07f 9/16; A01n 9/36

U.S. Cl. 260—948 **5 Claims**

1. A compound of the formula



in which R is alkylthioalkylene wherein the alkylthio moiety has from 1 to 3 carbon atoms and the alkylene moiety has from 2 to 4 carbon atoms, and *n* is the number 0 or 1.

3,897,522

ALKYL AND HALOALKYL N,N-DIALKYL-N-METHYLOLPHOSPHORODIAMIDATES

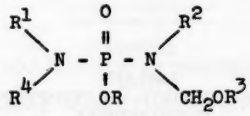
Patrick Michael Burke, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 261,812, June 12, 1972, abandoned. This application June 25, 1973, Ser. No. 373,144

Int. Cl. C07f 9/24; C08f 45/58

U.S. Cl. 260—953 **6 Claims**

1. Alkyl phosphorodiamidate having the formula



wherein

R is C_{1-5} alkyl having 0–3 substituents selected from chloro and bromo,

each of R^1 and R^2 when taken singly is selected from C_{1-3} alkyl and C_{1-3} chloro- or bromoalkyl,

R^3 is H, and

R^4 is H or CH_2OR^5 wherein R^5 is H,

provided that all carbon atoms alpha to the amide nitrogen and ester oxygen atoms are free of halo substituents.

3,897,523

CONTINUOUS PROCESS FOR PRODUCING DIALKYL PHOSPHOROCHLORIDOTHIONATES

Harold E. Sorstokke, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 107,836, Jan. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 102,498, Dec. 29, 1970, abandoned, which is a continuation-n-part of Ser. No. 20,714, March 18, 1970, abandoned. This application Sept. 18, 1973, Ser. No. 398,366

Int. Cl. C07f 9/14

U.S. Cl. 260—986 **8 Claims**

1. A continuous process for producing dialkyl phosphorochloridothionate which comprises:

a. continuously introducing a dialkyl phosphorothioic acid and chlorine into a first reaction mixture containing a dialkyl phosphorochloridothionate maintained at a temperature from about 40°C. to about 80°C. in a first chlorination zone wherein dialkyl phosphorothioic acid and chlorine are reacted, the amount of chlorine introduced into said first chlorination zone is between about 60 and about 93 percent of the chlorine feed to the process,

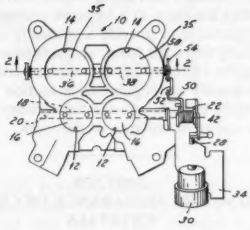
b. continuously transferring a portion of the first reaction mixture to a second chlorination zone wherein said first reaction mixture is continuously reacted with chlorine in a second reaction mixture maintained at a temperature of from about 40°C to about 80°C. the amount of chlorine introduced into said second chlorination zone is sufficient to bring the total amount of chlorine introduced into said first and second chlorination zones to between about 0.95 and about 1.5 moles of chlorine per mole of dialkyl phosphorothioic acid; and

c. recovering dialkyl phosphorochloridothionate.

3,897,524
CARBURETOR SECONDARY THROTTLE SHAFT CONSTRUCTION

Richard J. Freismuth, Mt. Clemens, and Joseph F. Lopiccola, Warren, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1974, Ser. No. 430,823
Int. Cl.² F02M 11/02
U.S. Cl. 261—23 A 8 Claims

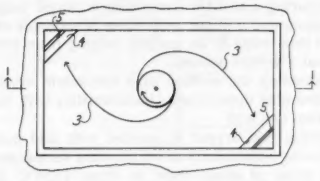


1. A carburetor having a pair of primary and a pair of secondary induction passages, a pair of primary and a pair of secondary throttle valves mounted for rotation in the respective passages, linkage means interconnecting the secondary throttle valves to the primary throttle valves for subsequent opening of the secondary throttle valves by the primary valves, and means mounting the secondary throttle valves on axially aligned shaft portions for an independent movement relative to each other to minimize leakage past the secondary throttle valves when closed.

3,897,525
APPARATUS FOR AERATING LIQUIDS IN A TANK HAVING WAVE ATTENUATOR

Herbert Auler, Aarbergen, Germany, assignor to Passavant-Werke Michelbacher Huette, Germany

Filed Feb. 26, 1974, Ser. No. 445,897
Claims priority, application Germany, Mar. 13, 1973, 2312476
Int. Cl.² B01F 3/04, 7/16
U.S. Cl. 261—91 9 Claims



6. In apparatus for aerating liquids in a polygonal aeration tank having at least one surface aerator mounted for rotation therein which creates horizontally directed surface flow that forms into waves as the flow progresses through the tank and impinges at an angle upon the tank wall:

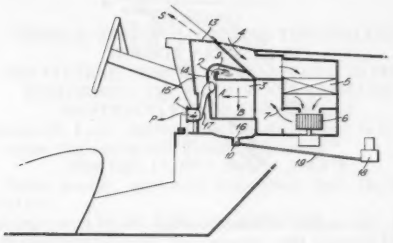
a. at least one substantially horizontal baffle mounted adjacent the inner wall of said tank adjacent the liquid level thereof and positioned at a point of high wave amplitude, and

b. there being at least one open flow passage through each said baffle for the circulation of liquid in an upward and a downward direction.

3,897,526
EVAPORATIVE COOLERS

Roger Neill Morse, Caulfield; Donald Pescod, Balwyn, and John Joseph Kowalczewski, East Hawthorn, all of Australia, assignors to Commonwealth Scientific & Industrial Research Organization, Campbell, Australia

Filed June 1, 1973, Ser. No. 365,949
Claims priority, application Australia, June 2, 1972, 9205/72
Int. Cl. B01f 3/04
U.S. Cl. 261—152 12 Claims



1. A method for cooling a defined space, comprising the steps of:

drawing a primary air flow through a first set of passageways formed in a heat exchanger and discharging same into the space;

separating a secondary air flow from the primary air flow after it has passed through the first set of passageways and causing the secondary air flow to pass through a second set of passageways formed in the heat exchanger and to discharge into the space in a stream which is separate from that portion of the primary air flow which is discharged directly into the space and,

supplying a liquid to the secondary air flow within the second set of passageways,

whereby the liquid is evaporated within the second set of passageways thereby to effect cooling of the secondary air flow and to effect cooling of the primary air flow by heat exchange between the respective sets of passageways,

said secondary air flow being so discharged into the space as to be directed onto or along a surface therein which radiates heat into the space whereby to effect cooling of the surface.

6. An evaporative cooling installation comprising:

a defined space to be cooled;

a heat exchanger constructed and arranged to define a first set of passageways and a second set of passageways in heat exchange relation with each other;

means to draw a primary air flow through the first set of passageways and to discharge the same into the space;

means to cause a secondary air flow to separate from the primary air flow after it has passed through the first set of passageways and to cause the secondary air flow to pass through the second set of passageways and to discharge into the space in s stream which is separate from that portion of the primary air flow which is discharged directly into the space, means to direct said secondary air flow onto or along a surface therein which radiates heat into the space whereby to effect cooling of the surface and;

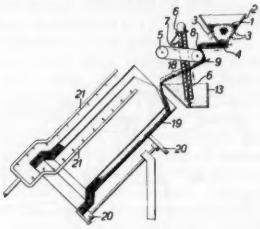
means to supply a liquid to the secondary air flow within the second set of passageways;

whereby the liquid is evaporated within the second set of passageways to effect cooling of the secondary air flow and to effect cooling of the primary air flow by heat exchange between the respective sets of passageways.

3,897,527
METHOD OF MANUFACTURING ARTICLES FROM HOT SOLID FILLER MATERIAL COATED WITH THERMOPLASTIC MATERIAL

Lars Ringdal, Montebelloveien 15, Oslo 3, Norway

Continuation-in-part of Ser. No. 20,622, March 18, 1970, abandoned. This application Mar. 28, 1972, Ser. No. 238,910
Int. Cl.[2] B29B 3/02
U.S. Cl. 264—37 8 Claims

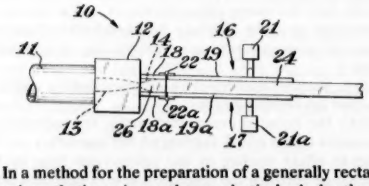


1. The method of manufacturing articles from particles of solid granular filler material and thermoplastic material, in which the particles of solid granular material are coated with thermoplastic material, the method comprising the steps of conducting particles of solid granular material adapted to store heat through a heating zone and therein heating the solid particles to be coated to a temperature substantially in excess of that required to melt the thermoplastic material in quantities sufficient to coat the solid particles with the stored heat therein, said particles of solid granular material being stable and substantially resistant to disintegration at the temperature used, conducting the resulting solid particles into a mixing zone subsequent to said heating, supplying powdered thermoplastic material to the mixing zone in a proportion sufficient to coat said solid particles, thoroughly mingling the solid particles with said proportion of powdered thermoplastic material and melting said thermoplastic material onto the surfaces of the solid particles by utilizing the stored heat of said particles to melt said thermoplastic material and thus coat the particles, passing the resulting plastic-coated solid particles directly and continuously into a mold having a shape of the article to be produced until said mold is filled, the plastic-coated solid particles as delivered into the mold being at such a temperature and containing such an amount of stored heat as a result of the heating in the heating zone as to maintain the plastic coating at a temperature such that the particles of plastic-coated solid particles stick to each other in the mold, and cooling the particles in the mold sufficiently to permit removal of the molded article from the mold.

3,897,528
METHOD FOR THE EXTRUSION OF THERMOPLASTIC FOAM

Kyung W. Suh, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 21, 1973, Ser. No. 417,845
Int. Cl. B29d 27/00; B29f 3/04
U.S. Cl. 264—51 4 Claims



1. In a method for the preparation of a generally rectangular foamed synthetic resinous thermoplastic body by the extrusion of a heat plastified foamable gel through an elongate orifice into a region between a pair of spaced apart generally parallel restraining means and cooling the foam to a generally self-supporting condition which shows shallow valleys or depressions extending in the direction of extrusion due to collapsing of the foam, the improvement which comprises

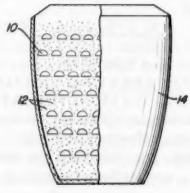
restraining the foam during expansion at a location generally adjacent the die and at ends of the extrusion orifice in a curvilinear pattern, the pattern having a maximum width of from about 1.2 to about 3 times the width of the die orifice, the edge restraining means being generally divergent away from the extrusion orifice and towards the generally parallel restraining means with the further limitation that the foam at a location generally adjacent the die is restrained to provide a generally concave edge to the initially extruded foam, and subsequently

expanding the extruded gel to a desired configuration having a generally rectangular cross-section to thereby provide a foam extrude of improved density uniformity and without apparent collapse of the foam.

3,897,529
ALTERING THE APPEARANCE OF CORUNDUM CRYSTALS

Ronald R. Carr, Merrillville, and Stephen D. Nisevich, Whiting, both of Ind., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 210,140, Dec. 20, 1971, abandoned. This application Dec. 4, 1972, Ser. No. 312,132
Int. Cl. F27d 7/00
U.S. Cl. 264—65 5 Claims



1. A process for altering the appearance of corundum crystals so as to produce crystals having uniform color appearance comprising the steps:

a. preparing a powder comprising a major proportion of alumina and a minor proportion of an oxide of titanium and iron oxide in an amount ranging from about 0.1 to about 1 weight percent;

b. contacting the surface of a corundum crystal having undesirable appearance characteristics with the powder of step (a); and

c. heating said crystal in contact with said powder in a reducing atmosphere at an elevated temperature within the range of about 1600° to about 1850°C. for a time sufficient to alter the appearance of said crystal so as to produce a crystal having a surface of uniform color.

3,897,530
METHOD FOR GUSSETING CONTINUOUS LENGTHS OF TUBULAR MATERIAL

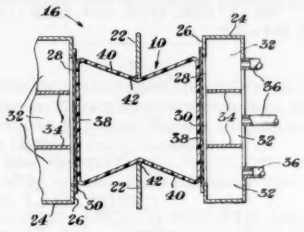
Joel M. Leathers, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 27, 1972, Ser. No. 301,679
Int. Cl. B29c 17/02
U.S. Cl. 264—89 4 Claims

1. In the method of gusseting a flexible tube, the steps of:

i. continuously advancing the tube,

ii. selectively applying a vacuum suction to opposed exterior surface areas of the tube to open the tube,
iii. leaving a select exterior surface area of the tube free of the application of said vacuum suction
iv. maintaining a negative gauge pressure within said tube in the vicinity of said vacuum suction applying step; and



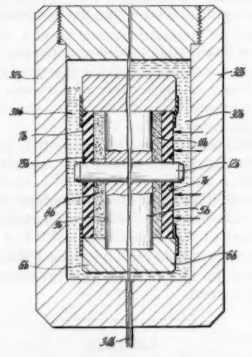
v. continuously inwardly tucking said free surface area to form a gusset structure in the tube, by means of inward collapse of said free section induced by atmospheric pressure acting cooperatively with the negative gauge pressure maintained within the tube.

3,897,531

MANUFACTURE OF COMPRESSED-POWDER BODIES

Gunter Overhoff, and Eckhard Kiefer, both of Radevormwald, Germany, assignors to Sintermetallwerk Krebsoege GmbH, Krebsoege, Germany

Filed Aug. 21, 1972, Ser. No. 282,323
Claims priority, application Germany, Sept. 9, 1971, 2145006
Int. Cl. B29j *5/00*
U.S. Cl. 264—109 **6 Claims**



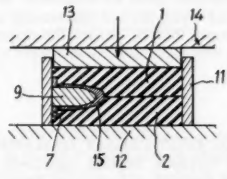
1. A method for manufacturing molded articles from pressed powder material by compression within molding apparatus including a centrally located, generally cylindrical main core member consisting essentially of solid inelastic material, an outer pressing jacket formed from elastic material surrounding said main core with a spacing therebetween forming a generally cylindrical annular molding cavity, and means including said outer pressing jacket enclosing said molding cavity, comprising:
a. positioning auxiliary core means consisting essentially of solid inelastic material to extend completely through said molding cavity transversely thereof between said pressing jacket and said main core member;
b. filling said molding cavity with moldable powder material;
c. applying fluid pressure externally of said pressing jacket to compress said powder material and bond the particles thereof into said molded article, said pressure being applied in a manner to act against said auxiliary core means;
d. disassembling said apparatus to permit removal of both said auxiliary core means and said molded article from within said molding cavity; and
e. removing said molded article from said cavity, said article being thereby formed with a transverse aperture extending therethrough.

3,897,532

METHOD OF MANUFACTURING THIN-WALLED HOLLOW ARTICLES OF POLYTETRAFLUORETHYLENE, APPARATUS FOR PERFORMING THE METHOD AND ARTICLES MANUFACTURED BY THE METHOD

Georges H. Lyssy, Zollikon, Switzerland, assignor to S & T Steiger Engineering AG, Zurich, Switzerland

Filed Sept. 17, 1973, Ser. No. 398,078
Claims priority, application Switzerland, Sept. 18, 1972, 13632/72
Int. Cl. B29c *3/00*; **F16l** *43/00*
U.S. Cl. 264—127 **5 Claims**



1. A method of manufacturing thin-walled hollow articles of polytetrafluoroethylene, which method comprises the steps of:
locating a rigid core within a mold comprising at least one female matrix made of a compressible elastic material while spacing the core from the inner walls of the mold by foraminous means by a predetermined distance,
introducing polytetrafluorethylene powder into said mold through said foraminous means to form a mass bearing against both the core and the inner wall of said matrix which substantially fills the space between said core and matrix,
compressing said compressible matrix inwardly by applying pressure thereto in a single direction while preventing peripheral expansion thereof, until said powder is formed into a predetermined article,
releasing said pressure, and
removing said article from said mold.

3,897,533

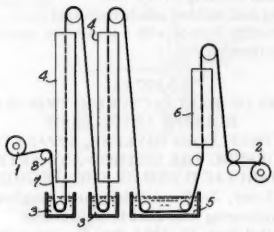
METHOD OF PRODUCING MOLDABLE REINFORCED THERMOPLASTIC MATERIAL AND ARTICLES THEREFROM

Hiroshi Hani, Fujisawa; Kazuo Hiraga, Yokohama; Masuo Tsudome, Yokohama; Hiroshi Kageyama, Yokohama; Shunichi Ito, Yokohama, and Shinji Iwai, Yokohama, all of Japan

Continuation of Ser. No. 13,840, Feb. 24, 1970, abandoned, which is a continuation-in-part of Ser. No. 647,975, June 22, 1967, abandoned. This application May 7, 1973, Ser. No. 357,530
Claims priority, application Japan, June 24, 1966, 41-040692; Oct. 12, 1966, 41-066669
Int. Cl. B29d *3/02*
U.S. Cl. 264—137 **6 Claims**

1. A method of producing moldable reinforced thermoplastic sheet material from vinyl chloride polymer having poor

adhesive property to reinforcing glass fiber and to itself, which comprises impregnating a reinforcing glass fiber mat having glass fiber longer than one-half inch with an oil-in-water emulsion of vinyl chloride polymer resin particles containing an organic solvent capable of partially swelling the resin particles until the impregnated polymer content reaches to 60 to 90% by weight of the sheet material to be produced, said emulsion



containing over about 30% by weight based upon the emulsion, of the polymer resin and from 5 to 30% by weight based upon the polymer, of the organic solvent, and said organic solvent being selected from hydrocarbons and halogenated hydrocarbons and drying the mat thus treated to remove water and organic solvent, thereby causing the polymer particles to coalesce firmly with one another and adhere to the glass fiber mat.

3,897,534

METHOD OF FIXING SHAFT TO HAMMER HEAD

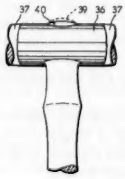
Michael Jeffery Stephens, Solihull, and Leslie Hill, Birmingham, both of England, assignors to Thor Hammer Ltd., Birmingham, England

Filed Sept. 13, 1973, Ser. No. 397,057

Claims priority, application United Kingdom, Sept. 13, 1972, 42409/72

Int. Cl. B29c *13/00*

U.S. Cl. 264—230 **3 Claims**



1. A method of fixing a shaft of plastics material in the head of a hammer of the type specified comprising providing a hammer head having a hole of waisted form extending therethrough for the reception of the end of a shaft, providing a preformed shaft of plastics material of an elastic memory type, one end portion, namely the end portion fixed in the head, of which is substantially oversize in cross-section in relation to the hole through the head, compressing said end portion in the cold to waisted form and to reduce its cross-sectional area such that the maximum cross-sectional area of said reduced end portion is only slightly greater than the minimum cross-sectional area of the hole through the hammer head, immediately following upon said operation of compression, force fitting said reduced end portion into the hole in the head by the application of force applied axially of the shaft, and allowing said compressed reduced end portion to elastically expand within the hole in the head of the hammer.

3,897,535

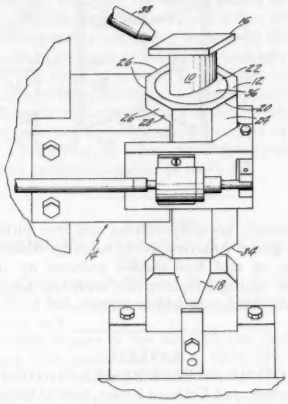
PROCESS FOR FIXTURING A WORKPIECE BY QUENCHING A LIQUID RESIN

Edward F. Lapac, West Hartford, Conn.; Joseph F. Miazga, Springfield, Mass., and Irving M. Mittleman, Glastonbury, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 29, 1973, Ser. No. 392,824

Int. Cl.² B29C *13/00, 6/04;* **B25B** *11/00*

U.S. Cl. 264—268 **9 Claims**



6. A process for securing a workpiece in a workholder wherein the workpiece is held in position by a special filler matrix which is bound together by a cold quenchable organic resin, including the steps of:

positioning the workpiece within the workholder;

heating the special filler to a temperature greater than the melting point of the organic resin;

disposing the special filler within the workholder around the workpiece;

heating to a liquid state a cold quenchable, organic resin, workholding material which has thermoplastic properties and exhibits a strength curve of the same general shape and temperature range as the curve shown in FIG. 2 of the specification;

disposing said liquid organic resin within the workholder around the workpiece so as to fill the interstices in the special filler; and

quenching simultaneously the workholder, workpiece and organic resin by contact with a quenching medium at a temperature of between 40° F and 73° F at least until the resin solidifies to hold the workpiece within a solid matrix comprising the special filler which is bound together by the organic resin.

3,897,536

PROCESS FOR THE MANUFACTURE OF A FRAME-WORK MEMBER OF A HOROLOGICAL DEVICE

Rodolphe Stooss, Le Landeron, Switzerland, assignor to Ebauches Electroniques S.A., Switzerland

Continuation-in-part of Ser. No. 192,080, Oct. 26, 1971, abandoned. This application Sept. 25, 1973, Ser. No. 400,625

Claims priority, application Switzerland, Dec. 11, 1970, 18344/70

Int. Cl.² B28B *1/24*

U.S. Cl. 264—328 **9 Claims**

1. A process for the manufacture of a frame-work member of a horological device comprising the steps of injection moulding said member from a synthetic material with a filling of reinforcing material while moulding at least one opening at a position which is to receive a bearing, thereafter injection

moulding the inside of said opening with a synthetic bearing material presenting a low coefficient of friction using an injection mould with a bearing forming die needle positioned in said opening and an injection nozzle spaced therefrom and positioned coaxially to said needle, and moulding said bearing by impacting the injected synthetic bearing material against the end of said needle for the even distribution thereof without flexure of said needle while forming said bearing in said member.

3,897,537

BENEFICIATION OF ILMENITE ORES

Michael Robinson; Frank Clamp; David Aberdeen, and David Barry Mobbs, all of Grimsby, England, assignors to Laporte Industries Limited, London, England

Filed Apr. 4, 1972, Ser. No. 241,057

Claims priority, application United Kingdom, Apr. 5, 1971, 8809/71; Jan. 7, 1972, 911/72

Int. Cl. C22b *1/00;* **C01g** *23/04;* **C21b** *1/00*

U.S. Cl. 423—86 **8 Claims**

1. A process for beneficiating an ilmenite ore, which comprises heating the ilmenite under oxidising conditions to yield a material of which at least 20% by weight comprises pseudobrookite, reducing the oxidised material to yield a material having at least 4% of its iron content (calculated as Fe) in the ferric state, and leaching the said reduced material to yield a beneficiated titaniferous material.

3,897,538

PRODUCTION OF GALLIUM OXIDE

Harry C. Snyder, Jr., Belleville, Ill., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed May 22, 1972, Ser. No. 255,521

Int. Cl. C01g *15/00*

U.S. Cl. 423—122 **2 Claims**

1. In the process of recovering gallium oxide from an alkali metal aluminate solution containing dissolved gallium, which comprises co-precipitating alumina and part of the gallium oxide by introducing into the solution an acid capable of effecting such co-precipitation, the improvement comprising circulating the co-precipitated alumina and gallium oxide through the solution for a period of at least 15 hours, whereby additional gallium oxide is precipitated from the solution.

3,897,539

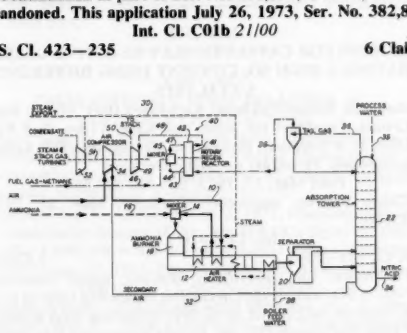
TAIL GAS NITROGEN OXIDE ABATEMENT PROCESS

Donald K. Fleming, Park Ridge, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 188,895, Oct. 31, 1971, abandoned. This application July 26, 1973, Ser. No. 382,821

Int. Cl. C01b *21/00*

U.S. Cl. 423—235 **6 Claims**



1. A method for abating nitrogen oxide in a tail gas stream which includes the steps of

delivering a tail gas waste stream containing nitrogen oxide to the obverse face of a rotating refractory wheel, said refractory wheel having communicating pathways from the obverse face to a reverse face, and divided into a preheat zone for preheating the gas stream and a reaction zone for treating the gas stream by an oxidation-reduction reaction,

said gas stream being preheated at said preheat zone of said wheel,

collecting said tail gas stream at the reverse face of the rotating wheel after movement through said preheat zone, said tail gas being preheated to ignition temperature,

combining said preheated tail gas stream with a stream of reducing gas,

moving said combined stream through the reaction zone of the wheel to reduce the nitrogen oxide in said tail gas stream at a reaction temperature which upper limit is sufficiently low to substantially reduce thermal damage to the materials used,

the heat or reaction developed at said reaction zone moving with the wheel to the preheat zone to again preheat a delivered tail gas stream, and

collecting an exhaust gas stream at a reduced outlet temperature after movement through said reaction zone wherein abatement of nitrogen oxide occurs.

3,897,540

METHOD OF CONTROLLING REACTION CONDITIONS IN A SULFUR DIOXIDE SCRUBBER

James H. Onnen, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Mar. 7, 1973, Ser. No. 338,762

Int. Cl. C01b *17/00*

U.S. Cl. 423—242 **5 Claims**

1. A continuous process for treating industrial stack gases containing sulfur dioxide comprising: contacting said industrial stack gases in the contact zone of a gas scrubbing tower with an aqueous medium containing a sulfur dioxide reactant material, said sulfur dioxide reactant material being an alkaline metal compound selected from the group consisting of calcium hydroxide, calcium carbonate, calcium bicarbonate, sodium bicarbonate, the naturally occurring materials trona and nahcolite, and combinations thereof, whereupon an initial reaction product is formed;

passing said aqueous medium, containing principally said initial reaction product, from the gas scrubbing tower into the upstream end of a filled continuously flowing reaction tank wherein said initial reaction product is further reacted, to form a second more stable reaction product as said aqueous medium flows through said tank;

monitoring the reaction conditions at a first location in said reaction tank and automatically adjusting the pH of the reaction conditions based upon a comparison of the information from said monitoring to a fixed standard in a pH range of from about 2 to 10;

monitoring the reaction conditions at a second location downstream of the first in the reaction tank and automatically adjusting the pH of the reaction conditions based upon a comparison of the information from said monitoring to a second fixed standard in a pH range of from about 2 to 10;

continuously removing a first portion of said aqueous medium containing said second reaction product from said reaction tank, removing said second reaction product for disposal and reintroducing said aqueous medium into said reaction tank; and,

continuously recirculating a second portion of said aqueous medium from said reaction tank to said scrubbing tower.

3,897,541

PROCESS FOR PREPARING PURE CYANOGEN CHLORIDE

Zoltan Kricsfalussy, Cologne; Karlheinz Blocher, Leverkusen; Juri Pawlowski, Leverkusen; Bernhard Scherhag, Leverkusen, and Raoul Weiler, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 17, 1972, Ser. No. 307,663

Claims priority, application Germany, Nov. 23, 1971, 2157973

Int. Cl. C01b *21/18*

U.S. Cl. 423—379 7 Claims

1. Process for preparing pure cyanogen chloride free of water and cyanuric chloride comprising reacting gaseous hydrocyanic acid with gaseous chlorine gas in the presence of a catalyst consisting essentially of active carbon having a specific surface, measured in accordance with BET, of from 800–1,100 m^2/g at temperatures in the range from about 500°C to about 700°C to form a reaction product consisting of cyanogen chloride and hydrogen chloride and thereafter recovering said pure cyanogen chloride.

3,897,542

α-MoC SUPERCONDUCTOR FIBERS

James Economy, Eggertsville, and William D. Smith, Tonawanda, both of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 158,356, June 30, 1971, abandoned. This application Dec. 17, 1973, Ser. No. 425,460

Int. Cl. C01b *31/34*

U.S. Cl. 423—440 12 Claims

5. A process for producing a fiber according to claim 1, comprising subjecting a fiber having a surface consisting essentially of dimolybdenum monocarbide and a core or carbon, to a pulse of electric voltage sufficient to raise momentarily the temperature of the fiber surface to a temperature ranging from about 2,000°C to about 2,500°C.

3,897,543

PROCESS FOR MAKING CRYSTALLINE CRYOLITE OF HIGH BULK DENSITY

Karl-Heinz Hellberg, and Joachim Massonne, both of Hannover, Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

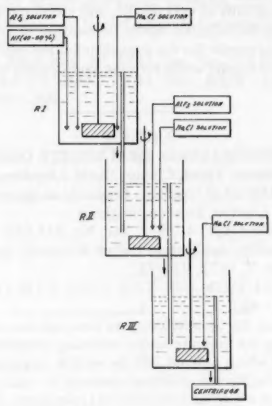
Filed May 31, 1973, Ser. No. 365,766

Claims priority, application Germany, June 6, 1972, 2227366; Sept. 9, 1972, 2244374

Int. Cl.[2] C01F *7/54, 7/50*

U.S. Cl. 423—465 16 Claims

1. A process for the production of crystalline cryolite particles having a bulk density between approximately 900 and 1,300 grams per liter which comprises reacting by slowly adding with continuous stirring to an aqueous solution of hydrofluoric acid containing at least 10 and at most 60% by weight of hydrogen fluoride, aqueous solutions of aluminum fluoride and a sodium salt of the group consisting of sodium chloride and sodium sulfate, while the temperature of the mixture is maintained between 10° and 80°C and its hydrogen-ion concentration at a value corresponding to a pH between 0 and 1.0, the solutions of aluminum fluoride and sodium salt being added simultaneously in amounts that correspond to an atomic ratio of Al:Na of about 1:3, and the total amounts of the solutions that are thus added being sufficient to react with



all of the hydrogen fluoride that is present in the reaction mixture.

3,897,544

METHOD FOR PRODUCING ANHYDROUS SODIUM DITHIONITE

Shohe Maeda, Ashiya-shi; Masayuki Yasue, Nara-shi; Mitsuo Aruga, Ichihara-shi; Sizuo Saito, Toyonaka-shi, and Ikuo Yasunaga, Minoo-shi, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Jan. 2, 1970, Ser. No. 451

Claims priority, application Japan, Jan. 10, 1969, 44-2244

Int. Cl. C01b *17/66*

U.S. Cl. 423—515 13 Claims

1. A method for producing anhydrous sodium dithionite, which comprises dissolving or suspending sodium formate or a mixture of sodium formate and a sodium compound in an aqueous solution of methanol, heating the reaction mixture to cause reflux, and feeding sulfurous anhydride into the reflux liquid whereby sulfurous anhydride being introduced into the reaction mixture wherein sulfurous anhydride is introduced as liquid SO_2, gaseous SO_2 or an SO_2-containing gas.

3,897,545

PROCESS FOR CATALYTICALLY REACTING GASES HAVING A HIGH SO_2 CONTENT USING DIFFERENT CATALYSTS

Lothar Reh, Bergen-Enkheim; Karl-Heinz Dorr, Mainz; Hugo Grimm, Frankfurt am Main, and Karel Vydra, Bad Nauheim, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 21, 1973, Ser. No. 343,584

Claims priority, application Germany, Mar. 21, 1972, 2213580

Int. Cl. C01b *17/78*

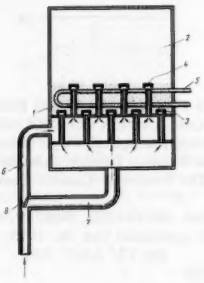
U.S. Cl. 423—534 6 Claims

1. Process for catalytically reacting gases containing 11%–60% SO_2 with oxygen in catalyst contacting trays to form SO_3, wherein the catalyst in the first contacting trays is different from the catalyst in the second contacting tray which comprises reacting said gases in the first contacting tray in contact with a vanadium pentoxide based catalyst and feeding the effluent gases from the first contacting tray to the second contacting tray without cooling and reacting said effluent gases therein in contact with an iron oxide based catalyst.

3,897,546
METHOD OF COOLING OR HEATING FLUIDIZED BEDS

Jaroslav Beranek, Prague; Milos Kaspar, Jirkov; Vladimir Bazant, Prague, and Antonin Chladek, Jirkov, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Oct. 19, 1971, Ser. No. 190,517
Claims priority, application Czechoslovakia, Oct. 22, 1970, 7115-70
Int. Cl. C22b *1/10*; C01b *31/20*; C01g *1/00*
U.S. Cl. 423—659 6 Claims



1. A method for adjusting and controlling the temperature in chemical reactors employing a single fluidized bed containing particles of varying size comprising the steps of

a. separating the fluidized bed into at least two subbeds superimposed one on the other, each having different physical longitudinal particle mixes than the other;

b. introducing a fluid media in two sectional streams to each of said subbeds, said fluid media streams extending from the bottom of said fluidized bed upwardly into their respective associated subbeds in direct contact with the particles;

c. continuing the flow of the fluid media to said separated subbeds of the fluidized bed during the chemical reaction;

d. locating a fluid media exchanger at least in the lowermost of said subbeds of the separated fluidized bed in indirect contact with said particles in said bed; and

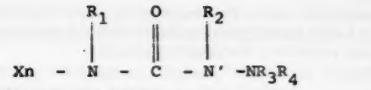
e. varying the relative rate of flow of the fluid media through each of the separated subbeds of the fluidized bed to vary the physical longitudinal particle mixing intensities in each part.

3,897,547
THIAXANTHENYL SEMICARBAZIDES AS ANTI-SECRETORY AGENTS

Stewart Sanders Adams; Bernard John Armitage; Norman William Bristow, and Bernard Vincent Heathcote, all of Nottingham, England, assignors to The Boots Company Limited, Nottingham, England

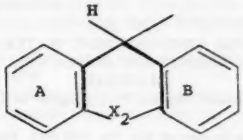
Division of Ser. No. 277,360, Aug. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 858,183, Sept. 15, 1969, Pat. No. 3,686,218, which is a continuation-in-part of Ser. No. 662,987, Aug. 23, 1967, Pat. No. 3,644,420. This application Oct. 29, 1973, Ser. No. 410,570
Claims priority, application United Kingdom, Apr. 5, 1967, 15692/67; Sept. 27, 1968, 46085/68; Sept. 2, 1966, 39384/66
Int. Cl. A61k *27/00*
U.S. Cl. 424—16 11 Claims

1. A therapeutic composition which comprises as an active ingredient an anti-secretory amount of a compound of Formula I



I

wherein Xn represents the group



in which

X_2 is sulphur,

the rings A and B may optionally contain substituents selected from the group consisting of halogen, lower alkyl, lower alkoxy and hydroxy;

R_1 is hydroxy, lower alkoxy, lower alkanoyloxy, hydrogen or lower alkyl;

R_2 is hydrogen or lower alkyl; and

R_3 and R_4, together with the nitrogen atom to which they are attached, form a saturated 5–7 membered heterocyclic ring, optionally containing an additional hetero group selected from O and <N-lower alkyl; or a pharmaceutically acceptable acid addition salt or quaternary salt thereof, in association with a pharmaceutically acceptable excipient, said composition being suitable for oral, rectal or parenteral administration.

3,897,548
ORAL COMPOSITIONS FOR RETARDING THE FORMATION OF DENTAL PLAQUE AND METHODS OF UTILIZATION THEREOF

Simon Katz, Indianapolis, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

Filed Apr. 9, 1973, Ser. No. 349,274. The portion of the term of this patent subsequent to July 19, 1989, has been disclaimed.
Int. Cl.[2] A61K *7/22*
U.S. Cl. 424—54 2 Claims

1. A method of removing dental plaque from and inhibiting the formation of dental plaque on dental enamel comprising the application thereof of a composition comprising:

about 0.0–50% by weight of a non-toxic antibacterial agent selected from the group consisting of hexachlorophene, tribromosalicylanilide, 3, 5-dibromo-3′ trifluoromethylsalicylanilide, p-aminosalicyclic acid, and p-aminobenzoic acid; and

0.01–10% by weight of fumaric acid.

3,897,549
HERPES SIMPLEX TYPE 2 VIRUS VACCINE AND METHOD OF PRODUCTION AND USE

Nathan Zygraich, Brussels, and Constant Huygelen, Huldenberg, both of Belgium, assignors to Recherche et Industrie Therapeutiques, Belgium

Filed Mar. 7, 1974, Ser. No. 448,850
Claims priority, application United Kingdom, Mar. 30, 1973, 15307/73
Int. Cl. C12k *5/00*, *7/00*
U.S. Cl. 424—89 6 Claims

1. A vaccination method broadly protective of the whole vaccinated organism against Herpes Simplex type 2, an exanthematous viral disease, consisting of administering into the upper respiratory tract, mucosa, or skin of a susceptible organism an effective dose of at least 10^3 $TCID_{50}$, protective against reinfection at warmer sites, of a temperature-sensitive and substantially non-pathogenic nitrous acid mutant strain of a Herpes Simplex type 2 virus responsible for said exanthematous viral disease, said mutant capable of multiplying at skin

temperature and in the mucosa of the upper respiratory tract but having partially or completely inhibited replication in the lower respiratory tract and in the body.

3,897,550

METHOD FOR ADMINISTERING WATER SOLUBLE DRUGS, NUTRIENTS AND OTHER SOLUTES TO A MAMMAL

Beverly L. Reynolds, Dallas, Tex., assignor to Cybersol, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 149,081, June 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 885,295, Dec. 15, 1969, Pat. No. 3,676,553. This application July 21, 1972, Ser. No. 273,849The portion of the term of this patent subsequent to July 11, 1989, has been disclaimed.

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—93 **6 Claims**

1. A method for administration of solutes to a mammal wherein the solutes are mixed in an aqueous solution, characterized by the aqueous solution having an osmolality in milliosmols/liter of 170 to 460, preferably 260 to 340, more preferably 290 to 310 and most preferably 300, a pH of 7.0 and 8.8 and more preferably between 7.5 and 8.5, and most preferably 8.1 and formed of compounds having an activity coefficient in the solution of at least 0.8 at 37°C to provide concentration in milliosmols/liter of Na^+ 75–200, preferably 85–150, more preferably 127–135 and most preferably 131, of K^+ 7–25, preferably 10–20, more preferably 13–15 and most preferably 14, of Mg^{++} 3–8 and preferably 5, of $HP0_4^=$ or $S0_4^=$ or Acetate or Gluconate 3–8 and preferably 5, or $HC0_3$ 12–28, preferably 10–30, more preferably 16–20 and most preferably 18 and of Cl^- 70–195, preferably 85–185, more preferably 124–130 and most preferably 127.

3,897,551

IODOGLUCAGONS AND PROCESS FOR PROLONGING THE BIOLOGICAL ACTIVITY OF GLUCAGON

William W. Bromer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 131,438, May 5, 1971, abandoned. This application Mar. 1, 1973, Ser. No. 337,264

Int. Cl.[2] C07C *103/52*

U.S. Cl. 424—177 **7 Claims**

1. A composition of matter comprising glucagon which has been iodinated to contain an average of from about 1 to about 5 gram atoms of non-radioactive iodine per mole of glucagon.

3,897,552

FUNGICIDAL AND BACTERICIDAL O-ALKYL-O-CYCLOHEXYL-S-ALKYL-, HALOALKYL-OR ALKENYL-PHOSPHOROTHIOLATES

Shigeo Kishino; Yasuo Yamada; Yoshio Kurahashi, and Toyohiko Kume, all of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

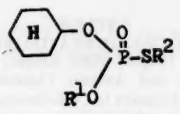
Division of Ser. No. 281,252, Aug. 16, 1972, Pat. No. 3,848,031. This application Sept. 11, 1974, Ser. No. 505,112

Claims priority, application Japan, Aug. 18, 1971, 46-62276

Int. Cl. A01n *9/36*

U.S. Cl. 424—219 **11 Claims**

1. A method of combating fungi and bacteria which comprises applying to such fungi, such bacteria or a habitat thereof a fungicidally or bactericidally effective amount of an organic O-alkyl-O-cyclohexylphosphorothiolate of the formula



wherein

R^1 is alkyl of one to six carbon atoms, and

R^2 is alkyl, haloalkyl or alkenyl of 1 to 6 carbon atoms; or propargyl.

3,897,553

PROCESS FOR COMBATTING PESTS USING ORGANOTIN COMPOUNDS

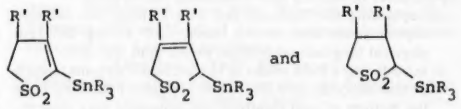
Donald J. Peterson, Springfield Twp.; James F. Ward, Fairfield Twp., and Ralph A. Damico, Colerain Twp., all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 184,225, Sept. 27, 1971, Pat. No. 3,808,264. This application Oct. 26, 1973, Ser. No. 410,057

Int. Cl.[2] A01N *9/00*

U.S. Cl. 424—245 **2 Claims**

1. A method for combatting pests selected from the group consisting of fungus, mites, insects, and bacteria comprising applying thereto a pesticidally effective amount of an organotin-substituted compound selected from the group consisting of compounds of the formula



wherein each R is selected from the group consisting of alkyl of from 1 to about 14 carbon atoms, phenyl, naphthyl, methoxyphenyl, p-chlorophenyl, p-tolyl, m-chlorophenyl, o-fluoro phenyl, m-nitrophenyl, α-chloronaphthyl, cyclohexyl, p-propoxyphenyl, and phenanthryl, and each R′ is selected from the group consisting of alkyl of from 1 to about 14 carbon atoms, phenyl, α-nitronaphthyl, naphthyl, p-tolyl, p-chlorophenyl, o-methoxyphenyl, p-bromophenyl, and hydrogen.

3,897,554

N-2-NITROBUTYL MORPHOLINE AND 2,2-DIBROMO-3-ITRILOPROPIONAMIDE AS A SLIME CONTROL COMPOSITION

Bernard F. Shema, Glenside; Robert H. Brink, Jr., Doylestown, and Paul Swered, Philadelphia, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed May 30, 1973, Ser. No. 365,386

Int. Cl.[2] A01N *9/22*

U.S. Cl. 424—248 **8 Claims**

1. A composition for the control of *Aerobacter aerogenes* in aqueous systems comprising N-2-nitrobutyl morpholine and 2-2-dibromo-3-nitrilopropionamide, wherein the weight ratio of the morpholine to the amide ranges from about 5:95 to about 95:5 respectively.

3,897,555
PHARMACEUTICAL COMPOSITIONS AND METHOD OF INHIBITING GASTRIC ACID SECRETION

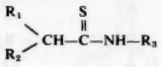
Bernard Loev, Broomall, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 255,828, May 22, 1972, Pat. No. 3,825,547. This application Apr. 12, 1974, Ser. No. 460,315

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 **10 Claims**

1. A pharmaceutical composition having gastric acid secretion inhibitory activity, in dosage unit form, comprising a pharmaceutical carrier and a gastric acid secretion inhibiting amount of a thioamide compound of the formula:



in which:

R_1 is 2-pyridyl;

R_2 is hydrogen, lower alkyl, lower alkenyl, lower alkoxy, allyloxy, cyclopropanemethoxy, phenyl or benzyl and

R_3 is an allyl or propargyl group optionally substituted by methyl or ethyl groups, said R_3 having 3–6 carbon atoms or a pharmaceutically acceptable acid addition salt thereof.

3,897,556
SUBSTITUTE PYRIDINOL-CONTAINING COMPOSITIONS AND METHODS FOR THE TREATMENT OF COCCIDIOSIS

Yasuhiro Morisawa; Mitsuru Kataoka; Taiichiro Watanabe; Noritoshi Kitano, and Toshiaki Matsuzawa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

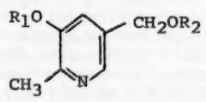
Filed Oct. 9, 1973, Ser. No. 404,641

Claims priority, application Japan, Oct. 20, 1972, 47-105090; Apr. 11, 1973, 48-41111

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 **24 Claims**

1. A poultry feed having dispersed therein for control of poultry coccidiosis from about 0.005% to about 0.05% by weight of a compound of the formula



wherein R_1 and R_2 may be the same or different and each represents a hydrogen atom; a lower alkyl group; benzyl; a halogen-substituted benzyl group; an unsubstituted straight or branched chain alkanoyl or alkenoyl group having a total of from 2 to 18 carbon atoms or substituted with a phenoxy group or a cycloalkanoyl group having a total of from 6 to 8 carbon atoms; an unsubstituted benzoyl or naphthoyl group or substituted with from 1 to 2 lower alkyl, alkoxy, halogen, nitro, cyano, carboxy or acetylamino groups; an alkoxycarbonyl group; a benzyloxycarbonyl group; a phenoxycarbonyl group; an unsubstituted carbamoyl group or substituted on the nitrogen atom thereof with a lower alkyl group of 1 to 2 carbon atoms, a cycloalkyl group of 5 to 7 carbon atoms or chlorophenyl group; an unsubstituted thiocarbamoyl group or substituted on the nitrogen atom thereof with a lower alkyl group of 1 to 2 carbon atoms, a cycloalkyl group of 5 to 7 carbon atoms or chlorphenyl group; or a salt thereof.

3,897,557
CARBAMOYLOXYIMINO-AZOLIDINES AS INSECTICIDES

Nazim Punja, Wokingham, England, assignor to Imperial Chemical Industries Limited, London, England

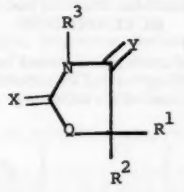
Division of Ser. No. 250,119, May 4, 1972, Pat. No. 3,843,669. This application June 10, 1974, Ser. No. 478,043

Claims priority, application United Kingdom, May 7, 1971, 13723/71

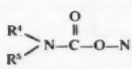
Int. Cl. A01n *9/14, 9/22, 9/28*

U.S. Cl. 424—270 **6 Claims**

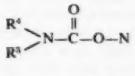
1. An insecticidal composition comprising, as active ingredient, an insecticidally effective amount of a compound of the formula:



wherein Q is oxygen, sulphur, sulphoxide or sulphone; R^1 and R^2 which may be the same or different are hydrogen or alkyl containing up to four carbon atoms; R^3 is hydrogen, alkyl containing up to eight carbon atoms, allyl, benzyl, dimethylamino, methyl-thiomethyl, ethoxycarbonylmethyl, or halo-substituted pyridyl; and either (i) X is a group of the formula:



where R^4 and R^5, which may be the same or different, are hydrogen, alkyl containing up to four carbon atoms, phenyl, chlorosubstituted phenyl, acetyl, chloromethyl, methoxymethyl, ethoxymethyl or ethylthiomethyl; and Y is oxygen, sulphur or alkylimino containing up to four carbon atoms; or (ii) Y is a group of the formula:



where R^4 and R^5, which may be the same or different, are hydrogen, alkyl containing up to four carbon atoms, phenyl, chlorosubstituted phenyl, acetyl, chloromethyl, methoxymethyl, ethoxymethyl or ethylthiomethyl; and X is oxygen, sulphur or alkylimino containing up to four carbon atoms, and a pesticidal carrier.

3,897,558
HYPOLIPEMIANT AND VASODILATATORY METHODS OF USE

Michael Hardy, Maisons-Alfort, and Daniel Humbert, Paris, both of France, assignors to Roussel Uclaf, Paris, France

Filed Aug. 8, 1974, Ser. No. 495,555

Claims priority, application France, Aug. 29, 1973, 73.31183

Int. Cl.² A61K *27/00*

U.S. Cl. 424—270 **2 Claims**

1. A method of inducing hypolipemic and vasodilatatory activity in a warm-blooded animal comprising administering

to a warm-blooded animal a hypolipemically and vasodilatatory effective amount of 2-methylthiazole-5-methanol.

3,897,559

ANTHELMINTIC PHENYLHYDRAZONES

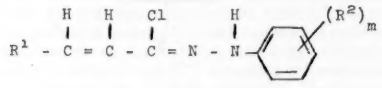
Henry Friedman, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 269,338, July 6, 1972, Pat. No. 3,824,233. This application Mar. 18, 1974, Ser. No. 452,027

Int. Cl. A61k *27/00*

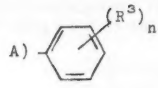
U.S. Cl. 424—275 **12 Claims**

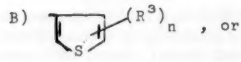
1. An anthelmintic composition which comprises a physiologically-acceptable carrier and an anthelmintically effective amount of a compound of the formula



wherein

R^1 represents





R^2 represents

A. C_1-C_3 alkyl,
B. C_1-C_3 alkoxy,
C. chloro,
D. bromo,
E. iodo,
F. trifluoromethyl,
G. cyano, or
H. two R^2 groups attached to adjacent carbon atoms of the phenyl ring represent methylenedioxy;

R^3 represents

A. C_1-C_3 alkyl,
B. C_1-C_3 alkoxy,
C. chloro,
D. bromo,
E. iodo,
F. trifluoromethyl,
G. cyano,
H. nitro, or
I. two R^3 groups attached to adjacent carbon atoms of the ring represent methylenedioxy; and

n and *m* independently represent 0-2.

3,897,560

PESTICIDAL METHODS EMPLOYING (ORGANOSULFONYLMETHYL) TRIHYDROCARBYLTIN COMPOUNDS

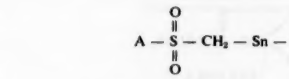
Donald J. Peterson, Springfield Twp., Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 164,941, July 21, 1971, Pat. No. 3,784,580, which is a continuation-in-part of Ser. No. 10,303, Feb. 10, 1970, abandoned. This application June 8, 1973, Ser. No. 368,141

Int. Cl. A01n *9/00*

U.S. Cl. 424—288 **7 Claims**

1. A method of combating insects comprising applying thereto an effective amount of a compound of the formula



wherein A is alkyl of from 1 to 14 carbon atoms; aryl; substituted aryl; R_2N-, where each R is alkyl of from 1 to 14 carbon atoms; and each R′ is alkyl of from 1 to 14 carbon atoms or aryl.

3,897,561

N-ALKYLTHIO-N-ALKYL ARYL CARBAMATES AS INSECTICIDES

Melancthon S. Brown, deceased, late of Berkeley, Calif., and by Gustave K. Kohn, special administrator, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 306,657, Nov. 15, 1972, Pat. No. 3,845,101, which is a continuation-in-part of Ser. No. 230,117, Feb. 28, 1972, Pat. No. 3,792,169, which is a division of Ser. No. 855,421, Sept. 4, 1969, Pat. No. 3,663,594, which is a continuation-in-part of Ser. No. 764,299, Oct. 1, 1968, abandoned. This application Sept. 5, 1974, Ser. No. 498,507

Int. Cl. A01n *9/12, 9/20*

U.S. Cl. 424—300 **12 Claims**

1. A method of controlling insects which comprises contacting said insects or their habitat with an insecticidally effective amount of the compound of the formula

wherein R is phenyl or 1-naphthyl substituted with up to 3 substituents selected from the group consisting of chlorine, bromine, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 3 carbon atoms and alkylthio of 1 to 3 carbon atoms, R^1 is alkyl of 1 to 6 carbon atoms and R^2 is alkyl of 1 to 10 carbon atoms.

3,897,562

2,2-DIBROMO-3-NITRILO PROPIONAMIDE AND PENTACHLOROPHENOL AS A SLIME CONTROL COMPOSITION

Bernard F. Shema, Glenside; Robert H. Brink, Jr., Doylestown, and Paul Swered, Philadelphia, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed June 15, 1973, Ser. No. 370,268

Int. Cl.² A01N *9/06*

U.S. Cl. 424—304 **8 Claims**

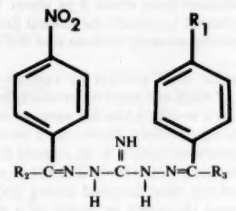
1. A composition for the control of Aerobacter aerogenes in aqueous systems comprising 2-2-dibromo-3-nitrilopropionamide and pentachlorophenol, wherein the weight ratio of the amide to the phenol ranges from about 5:95 to about 95:5 respectively.

3,897,563
ANTICOCCIDIAL COMPOSITION

Peter Kulsa, Scotch Plains, and Frank S. Waksmunski, South River, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 237,934, March 24, 1972, Pat. No. 3,795,692. This application Dec. 3, 1973, Ser. No. 421,199
Int. Cl. H61k *27/00*
U.S. Cl. 424—326 4 Claims

1. An anticoccidial composition comprising a therapeutically effective amount of an active anticoccidial compound having the formula:



wherein R_1 is nitro, halogen, trifluoromethyl, trifluoromethoxy, or cyano; and R_2 and R_3 are each hydrogen or loweralkyl, and a pharmaceutically acceptable acid addition salt thereof intimately dispersed in a carrier vehicle.

3,897,564
DIHYDROXYANTHRAQUINONE FUNGICIDES

Ronald J. Sbragia, Clayton, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 6, 1973, Ser. No. 385,761
Int. Cl. A01n *9/24*
U.S. Cl. 424—331 4 Claims

1. A method which comprises contacting a fungal organism with a fungicidal amount of a dihydroxyanthraquinone of the group consisting of 1,4-, 1,8- and 2,5-dihydroxyanthraquinone.

3,897,565
METHOD OF FEEDING SILKWORMS AN ARTIFICIAL EXPANDED FEED

Saburo Hotta, 9 Kimiwasa-cho, 33-chome, Totsuka-ku, Yokohama-shi, Kanagawa-ken; Kiyozi Wada, 877 Kumisawa-cho, Totsuka-ku, Yokohama-shi, Kanagawa-ken, and Yosiaki Kikuchi, 1130 Futoo-cho, Kohoku-ku, Yokohama-shi, Kanagawa-ken, all, Japan

Continuation-in-part of Ser. No. 57,830, July 23, 1970, abandoned. This application Mar. 19, 1973, Ser. No. 342,552
Claims priority, application Japan, July 25, 1969, 44-58369; Mar. 10, 1970, 45-19726
Int. Cl.[2] A23K *1/14, 1/16, 1/18*
U.S. Cl. 426—2 18 Claims

1. A method for raising silkworms, which comprises:
administering to silkworms a dry, expanded, foamed or porous, coagulated artificial silkworm feed composition consisting essentially of as a major proportional amount (1) pulverized dry mulberry leaf or pulverized dry castor oil plant leaf, (2) pulverized dry raw soybean, (3) dry gluten and (4) dry wheat flour or potato starch, and as a minor proportional amount, ingredients selected from the class consisting of saccharose, glucose and vitamins and minerals of nutritive elements for the growth and health of silkworms and mixtures thereof.

3,897,566
CHEWING GUMS HAVING LONGER LASTING SWEETNESS AND FLAVOR

Bernard J. Bahoshy, Mahopac, N.Y.; Charles E. Flynn, Oradill, N.J., and Gary P. Malunis, White Plains, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 6, 1973, Ser. No. 422,371
Int. Cl. A23g *3/00, 3/30*
U.S. Cl. 426—3 7 Claims

1. A chewing gum consisting essentially of a gum base, sweetener, flavor, and monosodium glutamate, said monosodium glutamate being fixed in gelatin and present in an amount effective to produce a longer lasting sweetness and flavor in said chewing gum.

3,897,567
NON-ADHERENT WRAPPING OF SHAPED PROTEIN FOOD PRODUCTS

Petrus Adam Inklaar, Diepenveen, Netherlands, assignor to Vasco Industries Corporation, Yonkers, N.Y.

Filed May 3, 1973, Ser. No. 356,815
Claims priority, application Netherlands, May 8, 1972, 7206173
Int. Cl. A23b *1/10;* A23c *19/16*
U.S. Cl. 426—8 16 Claims

1. A packed shaped protein-containing food product such as meat, sausage, cheese, or meat paste, comprising a shaped mass of the food product enveloped in a wrapping and having at the contacting surfaces of said wrapping and said mass a composition comprising an enzyme that is practically inactive at the pH of said mass and a pH control agent that creates in the presence of moisture a pH at which said enzyme is active, said enzyme and said pH control agent being present in quantities sufficient to inhibit adhesion of the wrapping to the food product yet so limited that the enzyme will act in only a limited surface layer of said mass in the presence of moisture.

3,897,568
PROCESS AND COMPOSITIONS FOR MANUFACTURE OF YEAST-RAISED PRODUCTS WITHOUT FERMENTATION

John A. Johnson, Manhattan, Kans., assignor to Kansas State University Research Foundation, Manhattan, Kans.

Filed Aug. 2, 1973, Ser. No. 385,167
Int. Cl. A21d *2/24*
U.S. Cl. 426—23 18 Claims

1. A fermentation compensator compositin for admixture with a flour yeast dough mix, said composition being in the form of a dry powder and consisting essentially of substantially completely hydrolyzed wheat gluten protein providing a mixture of the individual amino acids thereof and a mixture of food acceptable organic acid salts including a principal organic acid salt component selected from the water soluble food acceptable salts of acetic acid, lactic acid, and mixtures thereof, from 1 to 50 parts by weight of said mixture of organic acid salts being present per 100 parts of said mixture of amino acids.

9. A process for manufacturing yeast-raised baked dough products of the kind involving a standard fermentation stage for the flour yeast dough mix after preparation thereof of from 2 to 24 hours before said dough is formed into bodies of a size and shape for baking with brown crust formation, whrein the improvement comprises reducing or eliminating said fermentation stage while achieving at least as good flavor and physical properties in the baked products by the step of incorporating in said dough mix as it is prepared a hydrolyzate of wheat gluten protein composed essentially of a mixture of the individual amino acids thereof together with a mixture of food acceptable organic acids including a principal organic acid component selected from the group consisting of acetic acid, lactic acid, and mixtures thereof, said organic acids being in a form selected from said organic acids and sodium, potassium, and calcium salts thereof, said amino acid mixture being

incorporated in an amount of from 0.02 to 0.20% by weight based on the weight of the flour in said mix, and providing from 1 to 10×10^{-4} moles total acid per each 700 grams of said flour in said mix.

3,897,569
MALTING
Ronald Horgan, Eaglemont, Australia, assignor to Barrett Bros. & Burston & Company Proprietary Limited, Australia
Filed July 30, 1973, Ser. No. 383,729
Int. Cl.[2] A23L *1/185*
U.S. Cl. 426—28 5 Claims

1. A method of malting barley and other cereal grain comprising the steps of steeping the grain with water to initiate germination of the grain, continuing germination for a period of time to produce in the grain sufficient enzymes to complete the malting process, entraining the germinated grain in water and pumping it to a germination vessel by a pump which has an outlet pressure of at least 5 pounds per square inch, maintaining the grain in the germination vessel at a temperature of between 20° and 40°C for a period of not more than 48 hours while continuously aerating the grain, and thereafter drying the resulting malted grain.

3,897,570
PREPARATION OF AN ACIDIC BEVERAGE
Tamotsu Yokotsuka, Nagareyama; Yasuo Aoyama; Tadaaki Kikuchi; Shigetaka Ishii, and Masaru Matsuura, all of Noda, Japan, assignors to Kikkoman Shoyn Co. Ltd., Tokyo, Japan
Continuation of Ser. No. 267,214, June 28, 1972, abandoned, which is a continuation of Ser. No. 114,053, Feb. 9, 1971, abandoned, which is a continuation-in-part of Ser. No. 796,544, Feb. 4, 1969, abandoned. This application Jan. 28, 1974, Ser. No. 437,320
Claims priority, application Japan, Sept. 17, 1968, 43-66562
Int. Cl.[2] A23L *1/20, 2/00*
U.S. Cl. 426—46 13 Claims

1. A method for preparing an acidic beverage having a pH of less than 6.0 and capable of retaining clarity, provided that the beverage is free from other colloidal material, which comprises denaturing defatted soybeans by heating or steam cooking, subjecting the thus denatured soybeans to the enzymatic action of an acid protease at a pH of 2.5 to 6.0 at a temperature of 40° to 75°C to form soluble peptides until before the ration of formol-state nitrogen to total nitrogen in a filtrate of the resulting reaction mixture reaches 20%, separating a clear portion from the reaction mixture, and adding a beverage additive to the clear portion.

3,897,571
PROCESS FOR PRODUCING SLUSH BEVERAGE CONCENTRATE AND PRODUCT
Barry Homler, Ossining; Gerald S. Wasserman, Spring Valley, both of N.Y., and James E. Keehner, Salem, Oreg., assignors to General Foods Corporation, White Plains, N.Y.
Filed Dec. 4, 1972, Ser. No. 311,997
Int. Cl. A23l *1/00;* A23g *5/00*
U.S. Cl. 426—327 14 Claims

1. Process for producing a refrigeration-stable slushed comestible concentrate that is spoonable and stirable at 0°F which comprises partially crystallizing a saccharidal, aqueous hydrated gum-containing, viscous solution to form ice crystals having a size of 200 to 500 microns by slowly growing ice crystals after the solution is cooled to below its ice point and continuing said crystallizing process while agitating the solution to induce an overrun of 35–50% and while incorporating a gaseous phase therein until a stable tertiary phase of concentrated syrup matrix interspersed with coarse ice crystals is formed in a gaseous foam at a temperature of 15°–20°F; 75 to 90% of the water originally present in said solution being thereby converted to said ice crystals.

3,897,572
FORMED MEAT PRODUCT
Norman S. Riggs, and Felicisimo S. Sarno, both of Long Beach, Calif., assignors to Star-Kist Foods, Inc., Terminal Island, Calif.
Filed May 16, 1973, Ser. No. 360,735
Int. Cl. A23p *1/00*
U.S. Cl. 426—249 11 Claims

1. A method for making a simulated fat-marbled formed meat chunk comprising;

1. preparing a red meat portion by comminuting red meat and red meat by-products and admixing the same with a moisture binding agent selected from the class consisting of wheat gluten, soya protein, powdered egg and mixtures thereof in an amount from about 5 to about 50 weight percent and sufficient to absorb the natural juices of the meat released during cooking to form said red meat portion;
2. preparing a white meat portion by comminuting a a second portion of meat and meat by-products and admixing the same with a moisture binding agent selected from the class consisting of wheat gluten, soya protein, powdered egg and mixtures thereof in an amount from about 5 to about 50 weight percent and sufficient to absorb the natural juices of the meat released during cooking and about 0.5 to about 10percent by weight of a white food coloring agent to form a white meat portion;
3. forming a heterogeneous admixture of said red and white meat portions by blending a major part of said red meat portion with a minor part of said white meat portion until said red meat portion is webbed with said white meat portion;
4. extruding said heterogeneous admixture;
5. cooking said extrudate; and
6. dividing the cooked extrudate into chunks.

3,897,573
FISH PRODUCT
Kirsteen Ormiston Kelly, Dyce, Scotland, assignor to Lever Brothers Company, New York, N.Y.
Continuation of Ser. No. 250,336, May 4, 1972, abandoned. This application Dec. 12, 1973, Ser. No. 423,946
Claims priority, application United Kingdom, May 14, 1971, 14929/71
Int. Cl. A22c *25/00*
U.S. Cl. 426—272 6 Claims

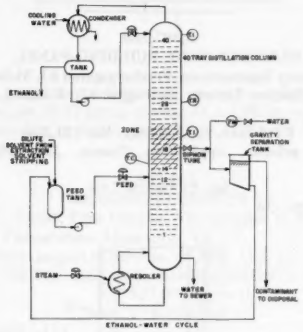
1. A process for the preparation of a sliced smoked fish product, which process comprises the steps of:

a. contacting raw fillets of salmon, trout or saithe with sodium chloride to provide salted fillets containing from 3 to 20% salt expressed on a wet weight basis;
b. coating said salted fillets with from 5 to 50% by weight of a binder containing finely divided, substantially bone-free, raw salmon, trout or saithe muscle, mixed with from 1 to 10% sodium chloride and from 3 to 8% of a food grade phosphate selected from sodium tripolyphosphate and sodium pyrophosphate, both said salt and said phosphate being expressed on a wet weight basis in terms of said finely divided raw muscle;
c. freezing said binder-coated fillets under pressure to provide integral blocks of uniform weight, shape and size;
d. tempering said blocks to a temperature below 0°C;
e. cutting said tempered blocks at a temperature below 0°C into slices of from 1 to 4 mm in thickness; and
f. subjecting said slices at an initial temperature below 0°C to an atmosphere of woodsmoke.

3,897,574
PURIFICATION OF ETHANOL EXTRACTANT IN SOY PROTEIN CONCENTRATE PROCESS

Darryl W. Pass, Fort Wayne, Ind., assignor to Central Soya Company, Inc., Fort Wayne, Ind.

Filed Mar. 21, 1974, Ser. No. 453,640
Int. Cl. A23j *1/14*
U.S. Cl. 426—430 4 Claims



1. In the process of defatted soybean flakes to produce soy protein concentrate having a minimum of 70% protein (N × 6.25) on a moisture-free basis, the steps of contacting defatted soybean flakes with ethanol of a concentration of about to 60 to 80% ethanol to extract the soluble solids from said defatted soybean flakes and stripping aqueous ethanol from said extract,

introducing the resultant aqueous ethanol solution into a tray-type column for rectification to provide rectified ethanol at the column top and waste water at the column bottom,

withdrawing at least periodically a portion of said ethanol solution from a point intermediate the column height to remove malodorous contaminants from said ethanol solution, and

recycling the rectified ethanol into contact with defatted soybean flakes and removing said waste water.

3,897,575
PREPARATION OF PHOSPHATIC ANIMAL FEEDS

Edward A. White, Glenview, Ill., assignor to International Minerals & Chemical Corporation, Libertyville, Ill.

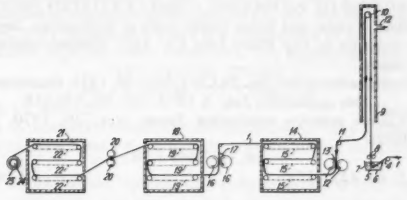
Filed Aug. 8, 1972, Ser. No. 278,706
Int. Cl. A23l *1/10, 1/20;* C01f *1/00, 5/00, 11/00*
U.S. Cl. 426—511 15 Claims

1. In a process for producing a phosphatic animal feed material by introducing phosphate rock and steam into a reaction zone wherein a temperature above the melting point of said phosphate rock is maintained, whereby said phosphate rock melts and fluorine is evolved, the improvement which comprises introducing said phosphate rock in finely-divided form into said reaction zone wherein a residence time of from about 0.01 to about 10 seconds is maintained, maintaining continuous suspended movement of said phosphate rock in said reaction zone during and after its melting to avoid any substantial accumulation of molten phosphate, and rapidly quenching molten phosphate recovered from said reaction zone to produce a solid product having a P/F weight ratio greater than 50 with phosphate in the form of alpha-tricalcium phosphate.

3,897,576
PRODUCTION OF SHEET MATERIAL FOR USE AS GASKETS

John Geoffrey Qualtrough, Bolton, and Harry Thornley, Rochdale, both of England, assignors to TBA Industrial Products Limited, Manchester, England

Continuation of Ser. No. 185,516, Oct. 1, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,774
Claims priority, application United Kingdom, Sept. 21, 1970, 44903/70
Int. Cl.[2] B29C *17/02*
U.S. Cl. 427—174 12 Claims



1. A process for producing in indefinitely long lengths a composite sheet constituted by surface coatings of fibre-reinforced elastomer bonded to both faces of a metal core, said process comprising the steps of compounding a curable dough from fibre, elastomer, curatives, fillers and a solvent system including a volatile solvent for the elastomer and a liquid which is a non-solvent for said elastomer, pelletizing said curable dough, coating both faces of the metal core with an adhesive which is slightly soluble in the volatile solvent and then feeding said pelletized dough and metal core through a nip between two calender rolls with said dough contacting only one adhesive coated face of said core while said volatile solvent coacts with said adhesive to cause preferential adhesion of said dough to said one adhesive-coated face of the metal core to form a coating thereon and said non-solvent liquid prevents adhesion of said dough to said rolls, passing the thus coated metal core to a drying device to remove the solvent system from the coating, passing the dry, but uncured, coated metal core together with further curable dough on the uncoated side thereof through a nip between two further calender rolls to spread said further curable dough over the other adhesive coated surface of the metal core to form a second coating thereon, passing the coated metal core to a drying device to remove the solvent system from said second coating, passing the coated metal core through a further nip between two calender rolls to consolidate the coatings and enhance the bond between the coatings and the core, then passing the coated metal core into an oven to cure the elastomer.

3,897,577
DRY PARTICULATE BLEND CONTAINING BINDER/DISPERSION AID COMPONENT COMPRISING CELLULOSIC AND VINYL ACETATE AND/OR ALCOHOL MATERIALS AND METHOD OF USING THE BLEND IN A ROLL-ON TEXTURE COMPOSITION

Richard H. Hymes, 7416 W. Shore Dr., Minneapolis, Minn. 55435

Filed Apr. 19, 1974, Ser. No. 462,507
Int. Cl.[2] B44C *1/20;* C08L *1/26*
U.S. Cl. 427—277 11 Claims

1. A dry particulate blend suitable for mixing with water to form a paste-like, roll-on wall or ceiling texture coating composition, comprising the following dry, intimately admixed particulate materials:

a. about 5 to about 20% by weight of expanded or intumesced or vitreous rock particles, said rock particles being generally within the size range of −3+40 U.S. mesh

and having true or apparent density less than 0.5 gram/cm³ and being suitable for providing a textured appearance on the surface of a coating obtained from said coating composition;

b. about 30 to 90% by weight of an inorganic pigment;

c. 1 – 7% by weight of a powdered, water dispersible vinyl acetate polymer containing 1 – 99.8% by weight vinyl alcohol units; and

d. 0.5 – 4% by weight of powdered methyl cellulose; the ratio, by weight, of vinyl acetate polymer to methyl cellulose being with the range of 4:1 to 1:3.

3,897,578

PROCESS OF PRODUCING CAPSULE-COATED SHEETS

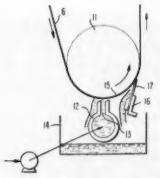
Masao Kanda, and Keiso Saeiki, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Continuation of Ser. No. 203,302, Nov. 30, 1971, abandoned. This application Jan. 2, 1974, Ser. No. 430,015

Claims priority, application Japan, Nov. 30, 1970, 45-105586

Int. Cl. B44d *1/44*

U.S. Cl. 427—358 **3 Claims**



1. A process of producing a capsule-coated sheet characterized by the steps of applying an excess of a coating composition containing microcapsules and having solids content of from about 20 to about 80 weight % and a viscosity of 50 to 50,000 C.P. to a running base sheet and thereafter applying a shearing force by means of a blade or metering bar to the coating composition by directly pressing thereagainst said blade or bar to remove excess coating composition from said base sheet and spread said composition uniformly over said running base sheet, said shearing force being insufficient to break said microcapsules.

3,897,579

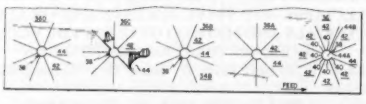
STARBURST PATTERN FOR FORMING PACKAGING LINERS AND PADS FROM SINGLE FACED CORRUGATED STOCK AND THE LIKE

David Weinstein, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Aug. 21, 1973, Ser. No. 389,620

Int. Cl. B32b *3/10, 3/28*

U.S. Cl. 428—13.4 **4 Claims**



1. A package liner for fragile articles, comprising:

sheet stock incised with starburst patterns predictably cut through sheet stock providing completely cut through starburst patterns without waste material, each of said starburst patterns nestably receiving said articles comprising a circular pattern of convergent rays of said sheet stock separated by substantially radially disposed slots formed through the sheet stock therebetween, all but one of said rays and the said slots defined therebetween terminating in arcuate inwardly facing edge portions, said edge portions thereby defining the major portion of the outer periphery of an arcuate port through said sheet stock at substantially the center of said starburst pattern, and one substantially keyhole shaped ray having an enlarged inner edge portion cut out of the convergent rays of the said stock conformally shaped with said arcuate port, said enlarged inner edge portion and said rays of each pattern being completely and predictably cut through with no waste material.

3,897,580

MULTIPLE-PANE BUILDING-PANEL

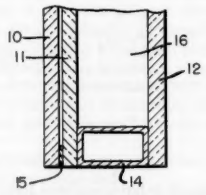
Nils Stig Percy Ingemansson, Fassbergsgatan 63, Molndal, and Jorgen Rasmus Larsen, Skolvagen 13, Kollered, both of Sweden

Filed Mar. 5, 1971, Ser. No. 121,336

Claims priority, application France, Jan. 28, 1971, 71.02883

Int. Cl.² B32B *1/04*

U.S. Cl. 428—34 **4 Claims**



1. A multi-pane buliding panel comprising in combination:

a. first and second glass panes each having a thickness so as to be self-supporting in its horizontal position when supported at its edges only, said panes being disposed in essentially parallel face-to-face relationship with each other with an undivided space between said panes,

b. said first and second glass panes being held together resiliently adjacent their edges,

c. the adjacent parallel faces of said first and second glass panes being spaced less than 2 millimeters from each other by air,

d. at least one other glass pane,

e. means for spacing said at least one other glass pane in parallel face-to-face relationship with said first and second panes,

f. said at least one other glass pane being spaced from the closest face of said first and second glass panes by a distance considerably greater than 2 millimeters by air

thereby securing, without appreciably increasing the overall thickness, a heat insulating building panel having greatly improved sound-insulating properties.

3,897,581

PLYWOOD VENEER OF EDGE-BONDED WET WOOD PIECES AND METHOD OF MAKING SAME

Ryuzo Nakatsuka, Yokohama; Mituo Furuta, Sagamihara; Setsuo Suzuki, and Nobuyoshi Kawahara, both of Yokohama, all of Japan, assignors to Sumitomo Bakelite Company, Limited, Tokyo, Japan

Filed Dec. 11, 1973, Ser. No. 423,707

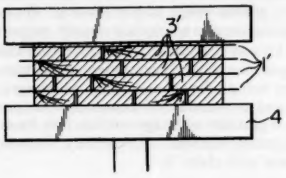
Claims priority, application Japan, Mar. 27, 1973, 48-34073; Mar. 27, 1973, 48-34074; Mar. 27, 1973, 48-34075; Apr. 10, 1973, 48-40042; Sept. 10, 1973, 48-101232

Int. Cl.² B32B *3/10, 27/40, 31/18;* **C08G** *18/02*

U.S. Cl. 428—44 **36 Claims**

1. A plywood veneer comprising a plurality of veneer strips bonded to one another by glue lines, said strips being bonded

with a water-cured adhesive composition consisting essentially of a hydrophilic, polyfunctional, liquid polyisocyanate pre-



polymer containing substantially no active hydrogen group and having an NCO group content of 2–15% by weight and a number average molecular weight of 1,000 to 20,000.

3,897,582

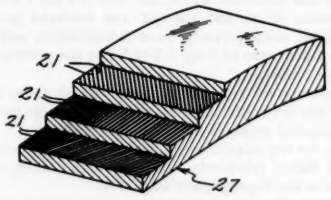
BRAKING ELEMENTS

Eugene L. Olcott, Falls Church, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Continuation-in-part of Ser. No. 65,899, Aug. 21, 1970, Pat. No. 3,738,906. This application Jan. 26, 1973, Ser. No. 327,971

Int. Cl.[2] B32B *5/12*

U.S. Cl. 428—114 **50 Claims**



1. A frictional braking element comprising a pyrolytic graphite microcomposite comprising pyrolytic graphite crystallite layers containing embedded therein, in an amount comprising about 5% to 95% by volume of said microcomposite, codeposited, dispersed crystals of a refractory carbide selected from the group consisting of silicon, zirconium, hafnium, titanium, tantalum, and niobium carbide, and mixtures thereof, said element comprising said microcomposite being shaped in the form of a frictional braking element.

3,897,583

ADHESION OF METAL TO RUBBER

Carlos Bellamy, Distrito Federal, Mexico, assignor to Uniroyal, S.A., Distrito Federal, Mexico

Filed Nov. 8, 1973, Ser. No. 414,052

Int. Cl.[2] B32B *15/02, 15/06;* **B60C** *9/02*

U.S. Cl. 428—256 **7 Claims**

1. A method of adhering brass plated wire reinforcement to rubber which comprises applying a solid vulcanizable rubber composition, comprising a conjugated diolefin polymer rubber, said composition containing, per 100 parts by weight of said rubber, from 0.01 to 0.2 part by weight of cobalt in the form of a cobalt salt (I), and (II) a resin-forming system comprising from 0.1 to 5 parts by weight of (A) a methylene donor which is a methylolated nitroalkane in which the hydrocarbon radical has 1 to 6 carbon atoms and from 0.1 to 5 parts by weight of (B) a resorcinol-type methylene acceptor, to the wire reinforcement to coat the same, and heating the assembly to vulcanize the rubber and to firmly adhere the wire reinforcement to the vulcanized rubber composition, the said cobalt salt (I) being a cobalt salt of an aliphatic or alicyclic carboxylic acid having from 6 to 30 carbon atoms, and the said methylene acceptor (B) being a fusible partially reacted resorcinol-alkyl aldehyde resin in which the alkyl aldehyde has from 1 to 4 carbon atoms.

3,897,584

RENDERING FIBROUS MATERIAL FLAME RETARDANT WITH CYAN AMIDE/HALOMETHYL PHOSPHONIC ACID SYSTEMS

Ronald Swidler; William A. Sanderson, both of Palo Alto, and William A. Mueller, Pasadena, all of Calif., assignors to Cotton, Incorporated, New York, N.Y.

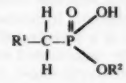
Continuation-in-part of Ser. No. 259,350, June 2, 1972, abandoned, which is a continuation of Ser. No. 153,094, June 14, 1971, abandoned, which is a continuation of Ser. No. 862,509, Sept. 30, 1969, abandoned. This application July 2, 1973, Ser. No. 375,440

Int. Cl.[2] B06M *1/22;* **C09B** *5/18*

U.S. Cl. 428—277 **6 Claims**

1. A process for rendering cellulosic and wool fiber-containing material durably flame retardant, which process comprises the steps of:

I. contacting the material with cyanamide and at least one phosphonic acid represented by the structural formula:



wherein R^1 represents a monovalent radical selected from the group consisting of chloro and bromo; and wherein R^2 represents a monovalent radical selected from the group consisting of hydrogen and lower alkyl, to deposit on the material a flame retarding amount of the phosphonic acid with cyanamide; and subsequently

II. heating the material to fix the phosphonic acid at a pH less than 2.5 with cyanamide on the material to give an add-on of between about 1% and 30%, and

III. contacting the material with an aqueous solution of at least one water-soluble compound possessing reactive N-methylol groups and curing the material to improve the durability of the flame retardancy of the material.

3,897,585

INTEGRAL REINFORCED STRUCTURES WITH A POLYUREA ADHESIVE COMPONENT

Louis L. Wood, Potomac, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 252,793, May 12, 1972. This application Aug. 28, 1972, Ser. No. 284,023

Int. Cl.[2] C08G *71/02*

U.S. Cl. 428—395 **6 Claims**

1. In combination, a reinforcement assembly, an elastomeric structure, and an adhesive, said adhesive consisting in the uncured state essentially of a non-crosslinked polyurea prepared by reacting a first component comprising polyisocyanate selected from the group consisting of tolylene diisocyanate, triphenylmethane-4,4′4″,-triisocyanate, benzene-1,3,5-triisocyanate, toluene-2,4,6-triisocyanate, diphenyl-2,4,4′-triisocyanate, hexamethylene diisocyanate, xylylene diisocyanate, chlorophenylene diisocyanate, xylylene diisocyanate, chlorophenylene diisocyanate, diphenylmethane-4,4′-diisocyanate, naphthalene-1,5-diisocyanate, xylene-alpha, alpha′-diisothiocyanate, 3,3′-dimethyl-4,4′-biphenylene diisocyanate, 3,3′-dimethoxy-4,4′biphenylene diisocyanate, 2,2′,5′5′-tetramethyl-4,4′-biphenylene diisocyanate, 4,4′-methylenebis (phenylisocyanate)c4,4′-sulfonylbis (phenylisocyanate),4,4′-methylene di-ortho-tolylisocyanate, ethylene diisocyanate, ethylene diisothiocyanate, trimethylenediisocyanate; and a second component comprising alkylene polyamine having from about 2 to about 23 pendant

amine groups in a non-protonic carbonyl containing solvent selected from the group consisting of acetone, methyl ethyl ketone, cyclohexanone, acetaldehyde, propionaldehyde, butyraldehyde, and isocbutyraldehyde; said polyamine and said solvent being first combined for from about 2 minutes to about 24 hours at a temperature of about −5° to about 150°C.; the molar ratio of isocyanate groups in the polyisocyanate to amine groups in the polyamine being from about 1:1 to about 1:20 isocyanate to amine; said adhesive being cured by addition of water and removal of the solvent from the non-cross-linked polyurea.

3,897,586

POLYMER COATED PIGMENT PARTICLES AND A PROCESS FOR THEIR PREPARATION

James Newton Coker, Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

Continuation of Ser. No. 61,480, Aug. 5, 1970, abandoned. This application Aug. 4, 1972, Ser. No. 277,883

Int. Cl.² B32B *5/16*

U.S. Cl. 428—403 **14 Claims**

1. A process for preparing polymer-coated finely divided inorganic particles which comprises suspending finely divided hydrophilic inorganic particles selected from the group consisting of metal oxides, clay, colloidal silica, and zinc chromate in a non-aqueous liquid reaction medium selected from the group consisting of aliphatic hydrocarbons and cyclohexane without the presence of a surface-active agent, adding polymerizable ethylenically unsaturated monomer selected from the group consisting of acrylic esters, methacrylic esters, vinyl esters, vinyl halides, vinylidene halides, acrylic acid, and methacrylic acid and a free-radical initiator to the medium at a rate which approximates the rate of polymerization, and polymerizing the monomer in situ onto the particles until a polymer loading of at least about 0.5 weight percent is reached, said liquid reaction medium being a solvent for the monomer and initiator and a non-solvent for the polymer formed as a coating on the particles.

3,897,587

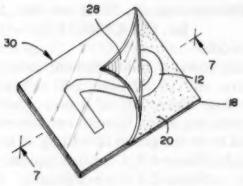
IMAGE TRANSFER SYSTEM

Donald Joseph Molner, 9 Varnum Ln., Englishtown, N.J. 07726

Continuation-in-part of Ser. No. 116,861, Feb. 19, 1971, Pat. No. 3,791,905. This application Nov. 12, 1973, Ser. No. 415,101. The portion of the term of this patent subsequent to Feb. 12, 1991, has been disclaimed.

Int. Cl.² B32B *7/06;* **B44C** *1/16;* **B65D** *69/00*

U.S. Cl. 428—409 **18 Claims**



1. An image transfer system for releasing a selected image from a clay-coated image bearing surface comprising the steps of placing a flexible transparent substrate having a pressure-sensitive, adhesive-coated layer over the image with the adhesive layer in confronting relationship to the image, applying pressure to the substrate to effect intimate contact between the adhesive layer and the image, soaking the image bearing surface in a liquid in which the clay coating is soluble to thereby release the image, separating the image bearing surface from the transparent substrate with the image being transferred to the adhesive layer on the transparent substrate, removing the clay residue from the transparent substrate, contacting a soft, flexible cohesive plastic limpid overlay lamina having an exposed smooth clingable face to the image to form a pliable image carrier whereby the carrier may be releasably secured to a selected smooth supportive surface.

11. A kit constructed in accordance with claim **10** further including a plurality of transparent substrates, each of the substrates being adapted to receive an image, a plurality of lamina, and a plurality of translucent supportive surfaces whereby a plurality of image carriers may be constructed.

18. A projectionable transparency slide constructed in accordance with claim **3.**

3,897,588

PROCESS FOR THE PRODUCTION OF LAMINATES UTILIZING PRE-TREATING FOLLOWED BY IMPREGNATION

Touru Nohtomi, Tokyo, Japan, assignor to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Filed Feb. 9, 1973, Ser. No. 331,030

Claims priority, application Japan, Feb. 12, 1972, 47-14333

Int. Cl.² B32B *17/10, 27/12, 27/38, 27/42*

U.S. Cl. 428—436 **19 Claims**

1. A process for the production of laminates comprising the steps of:

pre-treating glass-cellulose sheets composed of 20–70% by weight of cellulosic fibers and 30–80% by weight of glass fibers with at least one member selected from the group consisting of melamine resins prepared from formaldehyde and melamine in a molar ratio of from 1 to 6 in the presence of an acid catalyst, and methylol group-rich phenolic resins prepared from formaldehyde and phenol in a molar ratio of from 1.3 to 3.0 in the presence of an alkali catalyst,

impregnating the pre-treated sheets with an epoxy resin,

drying the impregnated sheets to form prepregs thereof,

arranging the prepregs for lamination,

placing on the outermost ones of the arranged prepregs a glass fabric previously treated with the epoxy resin as used in the impregnation step, and

laminating the arranged prepregs with the resin-treated glass fabric on the outermost prepregs to produce the laminate.

17. A metal-clad laminate obtained by the process of claim **2.**

3,897,589

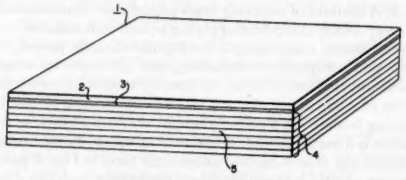
FAST CURING, WATER-RESISTANT LAMINATE MADE WITH ACCELERATED MELAMINE-ALDEHYDE RESIN AND ACCELERATED PHENOL-ALDEHYDE RESIN AND METHOD OF MAKING IT

Joseph F. Meier, Export, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 24, 1973, Ser. No. 363,774

Int. Cl.² B32B *27/04, 27/42, 31/12*

U.S. Cl. 428—525 **10 Claims**



1. A method of making a laminate comprising:

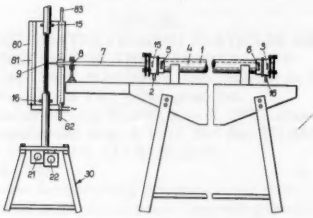
1. preparing a composition which comprises:
   A. a phenol and an aldehyde in a molar ratio of about 1.15 to about 2.0;
   B. about 0.0002 to about 0.01 phr of a catalyst selected from the group consisting of water-soluble carbonates, water-soluble bicarbonates, and mixtures thereof; and
   C. About 5 to about 100 phr of a solvent for said catalyst and for the resin produced by reaction of said phenol with said aldehyde;
2. heating said composition to convert said composition to at least about 95% of theoretical solids;
3. coating sheets of a first substrate with said composition to a ratio of coated substrate to uncoated substrate of about 1.1 to about 2.5;
4. partially drying said coated substrate;
5. forming a stack of said coated substrates;
6. placing on said stack at least one sheet of a second substrate coated with an accelerated resin consisting essentially of melamine and an aldehyde and containing about 0.001 to about 2% (based on resin solids) of a free-radical generator, said resin having about the same cure time as said phenol-aldehyde resin; and
7. curing the resins in said stack at an accelerated rate by heating said stack under pressure.

3,897,590

METHOD AND APPARATUS FOR MAKING MONOCRYSTALS

Karl Gürs, Niederhochstadt, Germany, assignor to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 825,345, May 16, 1969, abandoned. This application May 3, 1972, Ser. No. 249,998
Claims priority, application Germany, May 18, 1968, 1769405
Int. Cl.² B01J 17/08, 17/18; H01S 3/00
U.S. Cl. 13—1 31 Claims



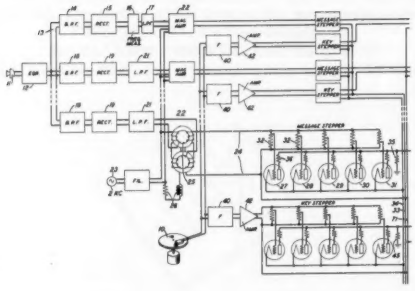
1. In a process for the production of a dielectric monocrystal from a raw material comprising a dielectric salt of a coordinative bound metallic acid in accordance with the floating zone melt process, the improvement which comprises melting the portion of said raw material which is to comprise the floating zone melt by irradiation with a laser beam.

3,897,591

SECRET TRANSMISSION OF INTELLIGENCE

Alexis A. Lundstrom, East Orange, N.J., and Luther G. Schimpf, St. George, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 27, 1942, Ser. No. 456,322
Int. Cl. H04I 9/00
U.S. Cl. 179—1.5 M 13 Claims



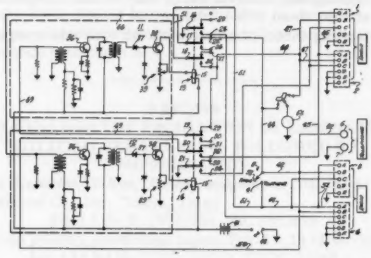
1. In a signal privacy system, means to convert a gradually varying signal current wave into a stepped wave, means to superpose on said stepped wave a masking current varying in magnitude in a manner unrelated to the signal to produce a stepped summation current wave for transmission, and means to eliminate short portions of the summation wave at the points where the steps occur to further conceal the signal.

3,897,592

VOICE-OPERATED TRANSMIT SYSTEM

Billy E. Walker, 37195 Lombardy Ave., Barstow, Calif. 92311

Filed May 11, 1973, Ser. No. 359,291
Int. Cl.² H04Q 7/00
U.S. Cl. 179—41 A 4 Claims



1. Control apparatus for intercommunicating remotely-located transmit-receive systems at least one of which is a radio system comprising:

a signal input and a signal output means for each of said systems, the input means applying a signal derived from a transmit-receive system to the control apparatus and the output means applying a signal derived from the control apparatus to a transmit-receive system, and

an electrical transmission system for each of said transmit-receive systems

each of said transmission systems including:

a pair of switching mechanisms each including a solenoid and a plurality of switches ganged to said solenoid, each of said ganged plurality including a normally-open and a normally-closed switch,

a pair of electrical transmission circuit, each circuit of said pair coupling signal input means of one of said systems to said signal output means of the other system, and

each of said transmission circuits including a separate one of said normally-open switches whereby each circuit is normally-open,

a pair of switch control circuits, each circuit of said pair coupling said signal input means of each one of said systems directly to a separate one of said solenoids,

each of said control circuits including a separate one of said normally-closed switches whereby the signal input energy is applied through said switches to said solenoids,

each of said switch control circuits further including means for processing said signal inputs energy into a form capable of energizing said solenoids,

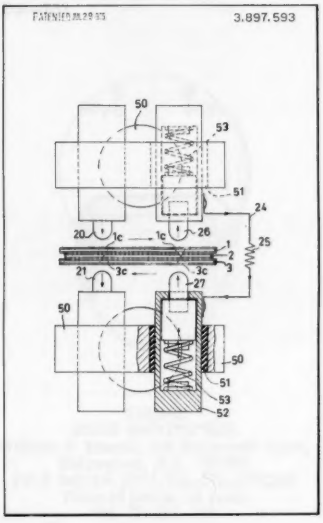
whereby the signal input into either systems energizes one of said switching mechanisms to close its normally-open transmission circuit and apply the input to said signal output of the other system,

each of said ganged switching mechanisms further including a second normally-open and grounded switch electrically coupled to said signal output means of said radio system whereby said solenoid energization closes said second switch for grounding and keying the transmitter of the radio system.

3,897,593
RESISTANCE WELDING OF SHEET METAL COATED WITH LAYERS

Otto Alfred Becker, 59 Robert-Koch-Strasse, 66, Saarbrucken 6, Germany

Division of Ser. No. 704,684, Feb. 12, 1968, Pat. No. 3,643,057. This application Dec. 30, 1970, Ser. No. 102,950
Claims priority, application Germany, Feb. 11, 1967, 91162; May 26, 1967, 92707; Apr. 24, 1967, 92210; Feb. 27, 1967, 91404
Int. Cl. B23k *9/28, 11/10*
U.S. Cl. 219—92 24 Claims



1. A device for resistance welding of insulation-coated sheet metal to at least one other coated sheet metal, said device comprising

a first main electrode and, in juxtaposition thereto, a second main electrode,

at least one first auxiliary electrode being arranged side-by-side of said first main electrode and being electrically insulated therefrom,

at least one second auxiliary electrode being arranged side-by-side of said second main electrode and being electrically insulated therefrom,

said first and second auxiliary electrodes being also in juxtaposition to each other,

means for moving at least one of said main electrodes and its adjacent auxiliary electrode toward and away from the other main and auxiliary electrodes so as to provide a space for placing

superposed insulation-coated sheet metal panels between said first and second main and auxiliary electrodes, and to establish contact between said sheet metal panels and said electrodes on moving the electrodes toward each other,

a shunt connecting the first main electrode with the second auxiliary electrode and

a shunt connecting the first auxiliary electrode with the second main electrode,

regulating resistor means provided in said shunts,

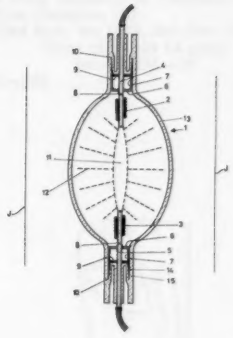
a welding current source, and

connections from said welding current source to said main electrodes.

3,897,594
HIGH PRESSURE MERCURY DISCHARGE LAMP

Hanns-Peter Popp, and Horst Grabner, both of Munich, Germany, assignors to Patent-Treuhand-Gesellschaft fur Elecktrische Gluhlampen mbH, Munich, Germany

Filed Mar. 19, 1974, Ser. No. 452,639
Claims priority, application Germany, Apr. 6, 1973, 2317461
Int. Cl.[2] H01J *17/04*
U.S. Cl. 313—214 10 Claims

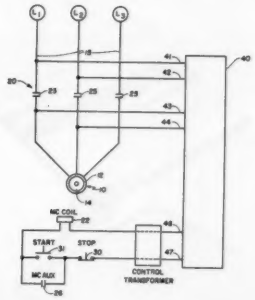


1. An improved high pressure mercury discharge lamp having a power input in excess of 1,000 watts comprising spaced apart electrodes in a bulb of transparent material having high heat capacity and containing metal halides, the improvement comprising the combination wherein the ratio of electrode spacing to inner diameter of the bulb is between 0.05 and 1 per kilowatt of power input to the lamp, and the ratio of power input in watts to volume of the discharge arc in cubic centimeters is from 10 to 100.

3,897,595
DYNAMIC MOTOR BRAKE CONTROL FOR AC MOTORS

John O. Fearno, Cologne, Minn., assignor to Helland Research and Engineering Inc., Minnetonka, Minn.

Filed Jan. 28, 1974, Ser. No. 437,400
Int. Cl. H02p *3/20*
U.S. Cl. 318—212 13 Claims



1. A control circuit for an alternating current motor having a stator winding adapted to be connected to an AC source of power for energizing the same and a power contactor for selectively connecting the stator winding to the AC source of power to operate the same comprising, a dynamic braking circuit for braking said motor from a running condition to a stop condition with disconnection by the power contactor of

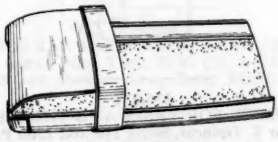
the AC source of power from the stator winding, said dynamic braking circuit including a variably operated rectifying means, a braking contactor including contact means for connecting the AC source of power through the rectifying means to the stator winding to apply rectified AC current to the stator winding to brake the motor, a first control circuit inlcuding a switching means having two conditions of operation, a second control circuit connecting to the first control circuit to be controlled thereby in one condition of its operation and including a switching means having two conditions of operation, said second control circuit in one condition of operation being operative to energize the braking contactor and operate the rectifying means, aand means selectively responsive to the energization of the stator winding for controlling the first control circuit means between the two conditions of switching operation, said means responsive to the connection of the stator winding to the source of power being an optical coupling.

DESIGNS

JULY 29, 1975

236,041
PROTECTIVE HELMET
Robert E. Conroy, Park Ridge, Ill., assignor to Servotronics, Inc., Buffalo, N.Y.
Filed June 29, 1973, Ser. No. 374,963
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232

236,042
SHOE PROTECTOR
William F. Martin, 350 Stonycroft Road, Ridgewood, N.J. 07450
Filed July 16, 1973, Ser. No. 379,246
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—271



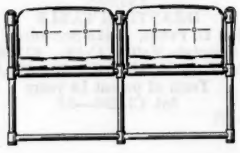
236,043
BOWLING GLOVE
Donald J. Carter, Miami, Fla., and Frank P. Esposito, Paramus, N.J., assignors to National Athletic Supply Corporation, Paramus, N.J.
Filed June 3, 1974, Ser. No. 475,834
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361

236,044
BOWLING GLOVE
Donald J. Carter, Miami, Fla., and Frank Esposito, Paramus, N.J., assignors to National Athletic Supply Corporation, Paramus, N.J.
Filed Sept. 14, 1973, Ser. No. 397,602
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361

236,045
DRAFTING TABLE
Gordon D. Petrie, 11428 Snowdrop Ave., Fountain Valley, Calif. 92708
Filed Aug. 30, 1973, Ser. No. 393,078
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27

236,046
CHAIR OR SIMILAR ARTICLE
Jonathan Ginat, New York, N.Y. (% A.C.I. Industries, Inc., 38—60 Review Ave., Long Island City, N.Y. 11100)
Filed Oct. 16, 1973, Ser. No. 406,819
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49

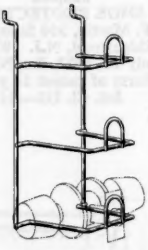
236,047
LOVE SEAT
Thomas C. Hoshall, 8300 Brookridge, Oklahoma City, Okla. 73132, and Kent W. Bouldin, Oklahoma City, Okla.; said Bouldin assignor to said Hoshall
Filed May 21, 1973, Ser. No. 361,868
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—60



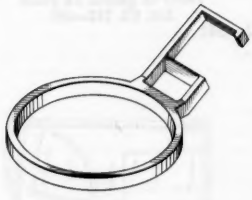
236,048
SEAT OR SIMILAR ARTICLE
Stanley P. Nash, Johnson Creek, Wis., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed Aug. 30, 1973, Ser. No. 392,955
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—63

236,049
SIDE CHAIR
William H. Tacke, Wyoming, Mich., assignor to Curtis Products Ltd., Cobourg, Ontario, Canada
Filed June 11, 1973, Ser. No. 369,071
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

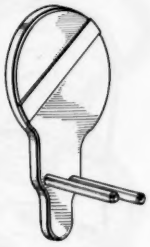
236,050
DISPLAY AND DEMONSTRATOR RACK FOR CYLINDRICAL LOCKSETS AND THE LIKE
William M. Folberth, 3535 W. 140th St., Cleveland, Ohio 44111
Filed Oct. 20, 1972, Ser. No. 299,253
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—114



236,051
HOLDER FOR VASES AND THE LIKE
Victor E. Opincar, Sr., 7 Terrace, Lido Park, Newport Beach, Calif. 92660
Filed Nov. 29, 1973, Ser. No. 419,917
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D6—114

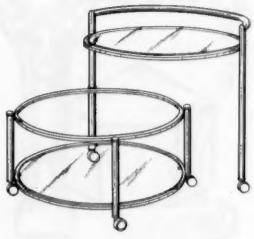


236,052
TENNIS RACQUET HOLDER OR THE LIKE
Donald C. Trieschmann, 615 Cherry St., Winnetka, Ill. 60093
Filed Nov. 21, 1973, Ser. No. 417,877
Term of patent 3½ years
Int. Cl. D6—*06*
U.S. Cl. D6—114

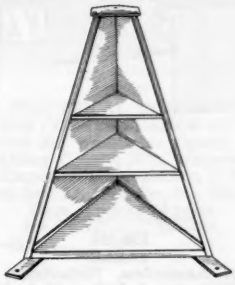


236,053
COMBINATION GARMENT DISPLAY ARM AND MOUNTING BRACKET
Stanley A. Friedberg, 7143 Woodrow Wilson Drive, Hollywood, Calif. 90028
Filed Jan. 21, 1974, Ser. No. 435,304
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D6—116

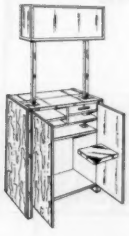
236,054
MOBILE BAR TABLE OR SIMILAR ARTICLE
Jonathan Ginat, New York, N.Y. (% A.C.I. Industries, Inc., 38—60 Review Ave., Long Island City, N.Y. 11100)
Filed Oct. 16, 1973, Ser. No. 406,820
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—144



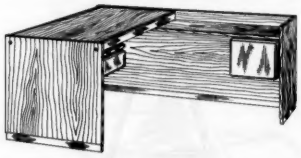
236,055
TOOL SUPPORT STAND
Derek Hogg and John Fairburn Askam, Sutton Coldfield, England, and Roger Anthony Wilson, Wrexham, Wales, assignors to Dunlop Limited, London, England
Filed Nov. 6, 1972, Ser. No. 303,841
Claims priority, application Great Britain May 11, 1972
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—145



236,056
POINT-OF-PURCHASE SALES CONSOLE
Irvin M. Lemon, 321 Via Pasqual, Redondo Beach, Calif. 90277
Filed Oct. 11, 1973, Ser. No. 405,411
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—158

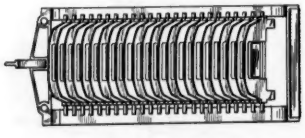


236,057
COMBINED DESK AND SIDE EXTENSION UNIT
Douglas C. Ball, Senneville, Quuebec, Canada, assignor to Massey-Ferguson Industries Limited, Toronto, Ontario, Canada
Filed Aug. 30, 1973, Ser. No. 393,257
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—159



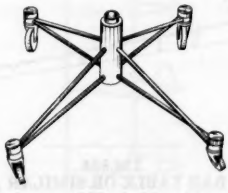
236,058
TABLE
Friso Kramer, Amsterdam, Netherlands, assignor to Wilkhahn, Wilkening & Hahne, Einbeckhausen, Germany
Filed May 8, 1973, Ser. No. 358,377
Claims priority, application Denmark Nov. 9, 1972
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

236,059
RECORD HOLDING DEVICE
Julian Gutierrez, 6233 Brookview Ave., Minneapolis, Minn. 55424
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—185

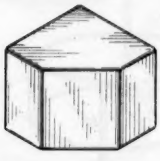


236,060
HANGING CHAIR FRAME
Phillip A. Gass, 241 S. 89th St., Omaha, Nebr. 68114
Filed Sept. 6, 1973, Ser. No. 394,919
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

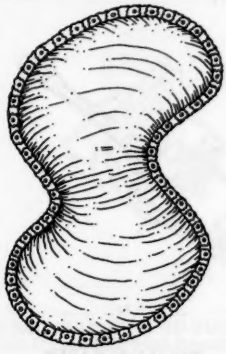
236,061
CHAIR BASE
William H. Tacke, Wyoming, Mich., assignor to Curtis Products Ltd., Cobourg, Ontario, Canada
Filed Dec. 3. 1973, Ser. No. 420,978
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196



236,062
FACE PILLOW
Laura Winston, 710 S. Hobart Blvd., Apt. 206, Los Angeles, Calif. 90005
Filed June 12, 1972, Ser. No. 261,585
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201



236,063
BED PILLOW
Seroun Kesh, 18982 Ardmore, Detroit, Mich. 48235
Filed May 29, 1973, Ser. No. 364,251
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—204

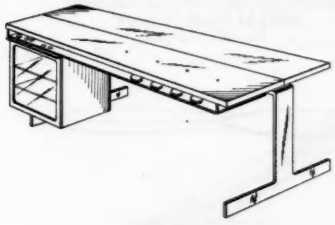


236,064
UTENSIL FACILITATING SNAIL-EATING
Paul Balbo, 76 Village Road S., Brooklyn, N.Y. 11223
Filed Sept. 26, 1973, Ser. No. 400,727
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—7

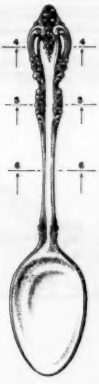
236,065
LEG FOR A SERVING UTENSIL
Robert Haber, 834 Edward St., Baldwin, N.Y. 11510
Filed June 18, 1973, Ser. No. 370,791
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—39

236,066
LADLE OR SIMILAR ARTICLE
Eleanore C. Best, Woodville, Wis. 54028
Filed Sept. 24, 1973, Ser. No. 400,430
Term of patent 7 years
Int. Cl. D7—*02*
U.S. Cl. D7—104

236,067
COMBINED ELECTRICAL INDUCTION HEATING TABLE TOP COOKING RANGE AND OVEN
Philip H. Peters, Jr., Washington County, and John L. Matrone, Albany County, N.Y., assignors to Environment/One Corporation, Schenectady, N.Y.
Filed Sept. 23, 1971, Ser. No. 183,289
Term of patent 14 years
Int. Cl. D7—*02;* D6—*04*
U.S. Cl. D7—111



236,068
SPOON OR SIMILAR ARTICLE
Melvin A. Lea, Oneida, N.Y., assignor to General Mills, Inc., Minneapolis, Minn.
Filed Aug. 16, 1973, Ser. No. 389,096
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

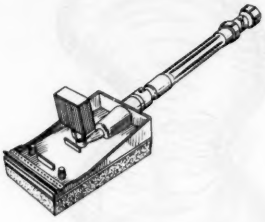


236,069
SPAGHETTI FORK
Malcolm R. Braid, 1005 Cumberland Drive, Auburn, Ala. 36830
Filed Oct. 19, 1973, Ser. No. 408,154
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

236,070
KNIFE
William A. Dart and Laurence T. Uridge, Mason, Mich., assignors to Dart Container Corporation, Mason, Mich.
Filed June 22, 1973, Ser. No. 372,643
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—138

236,071
HOLDER FOR SCRUB PADS OR THE LIKE
Ronald O. Zemke, White Bear Lake, Minn. (P.O. Box 33427, St. Paul, Minn. 55133)
Filed Jan. 18, 1974, Ser. No. 434,648
Term of patent 14 years
Int. Cl. D7—*05*; D4—*01*
U.S. Cl. D7—178

236,072
VEHICLE WASHER
Andrew Ng Fai Tsang, Block B, 9th Floor, Wah Hing Industrial Mansions, Tai Yau St., N.K.I.L. 4411, San Po Kong, Kowloon, Hong Kong
Filed Sept. 4, 1973, Ser. No. 394,145
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—179

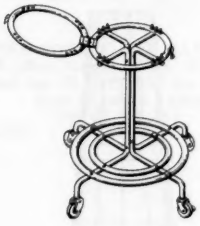


236,073
BOTTLE SCRAPER
William P. Monagle, 507 Pueblo St., Boise, Idaho 83702
Filed Feb. 28, 1974, Ser. No. 446,873
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—184

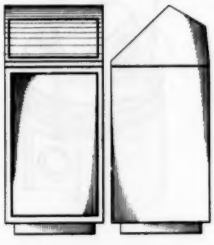
236,074
COMBINED BOTTLE SCRAPER AND CAP
William P. Monagle, 507 Pueblo St., Boise, Idaho 83702
Filed Feb. 28, 1974, Ser. No. 446,866
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—184

236,075
UTILITY PAIL OR THE LIKE
Henry Golden, 1571 Elmwood Ave. 14620, and Samuel R. Genca, 36 Longcroft Road 14609, both of Rochester, N.Y.
Filed Jan. 9, 1974, Ser. No. 432,085
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—187

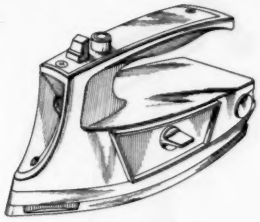
236,076
GARBAGE BAG SUPPORT AND STORAGE DEVICE
Harold J. Comeaux, 1448 Bonnabel Blvd., Metairie, La. 70005
Filed Sept. 7, 1973, Ser. No. 395,060
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—193



236,077
TRASH RECEPTACLE
Robert Gault, 2043 Angling Road, Corfu, N.Y. 14036
Filed Jan. 2, 1974, Ser. No. 429,715
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—194

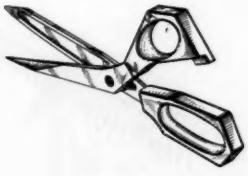


236,078
IRON OR SIMILAR ARTICLE
John C. Shalvoy, Fairfield, Conn., assignor to General Electric Company
Filed July 10, 1974, Ser. No. 486,982
Term of patent 14 years
Int. Cl. D7—*205*
U.S. Cl. D7—203

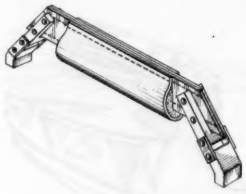


236,079
TORQUE WRENCH LEVER
Bosko Grabovac, Mission Viejo, Calif., assignor to Consolidated Devices, Inc., South El Monte, Calif.
Filed June 24, 1974, Ser. No. 482,332
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—24

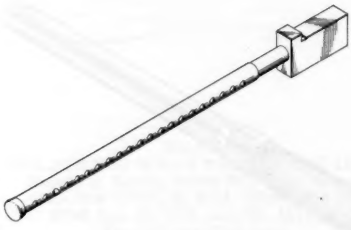
236,080
SCISSORS
Richard T. Hopcraft, Cranston, R.I., assignor to Imperial Knife Co. Inc., Providence, R.I.
Filed Aug. 22, 1974, Ser. No. 499,518
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57



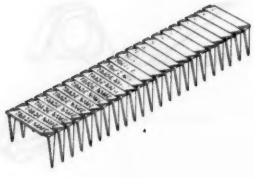
236,081
HANDLE FOR LUGGAGE
Joseph Y. Pelavin, North Bergen, N.J., assignor to Lark Luggage Corporation
Filed Mar. 1, 1974, Ser. No. 447,435
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—154



236,082
ADJUSTABLE BAR FOR BLOCKING SLIDING DOORS AND WINDOWS
Clarence D. Williams, Los Angeles, Calif. (20227 Itasca St., Chatsworth, Calif. 91311), and Francis M. Archdekin, 2721 W. Verdugo, Burbank, Calif. 91505
Filed Dec. 10, 1973, Ser. No. 423,421
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—203

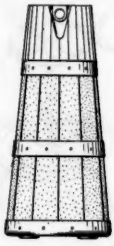


236,083
STRIP OF STAPLES
Robert E. Olson, 9014 Callaghan Road, San Antonio, Tex. 78230
Original design application May 18, 1972, Ser. No. 254,834. Divided and this application Dec. 17, 1973, Ser. No. 425,091
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—266



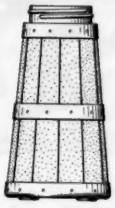
236,084
PRESSURIZED DISPENSING CONTAINER
Tor Petterson, Palos Verdes Peninsula, Calif., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Nov. 29, 1973, Ser. No. 420,041
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—9

236,085
DISPENSING CONTAINER FOR MARGARINE OR THE LIKE
Richard L. Gannett and Jeffrey L. Ashby, Dallas, Bruce E. Welsh, Jr., and Daniel A. Leo, Richardson, and Carlton W. Howorth, Dallas, Tex., Robert E. Corba, Racine, Wis., and Robert N. Carow and James M. Beck, Chicago, Ill., assignors to Anderson, Clayton & Co., Houston, Tex.
Filed Sept. 29, 1972, Ser. No. 293,358
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—9



236,086
CONTAINER FOR LIQUIDS
Henry D. Manley III, 13 Race St., Bloomfield, N.J. 07003
Filed May 14, 1973, Ser. No. 360,299
Term of patent 3½ years
Int. Cl. D9—*01*
U.S. Cl. D9—23

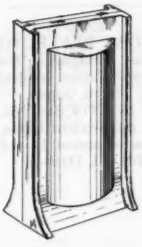
236,087
BOTTLE
Richard L. Gannett and Jeffrey L. Ashby, Dallas, Bruce E. Welsh, Jr., and Daniel A. Leo, Richardson, and Carlton W. Howorth, Dallas, Tex., and Robert E. Cobra, Racine, Wis., assignors to Anderson, Clayton & Co., Houston, Tex.
Filed Sept. 29, 1972, Ser. No. 293,357
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D8—28



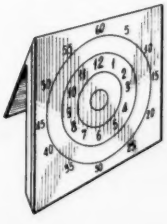
236,088
COMBINED BOTTLE AND CAP THEREFOR
Ken Bradley, Mercer Island, Wash. 98040
Filed Jan. 27, 1972, Ser. No. 221,484
Term of patent 7 years
Int. Cl. D9—*01*
U.S. Cl. D9—51

236,089
PLASTIC PREFORM CONTAINER OR THE LIKE
Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Continuation-in-part of design application Ser. No. 247,914, Apr. 26, 1972. This application May 23, 1973, Ser. No. 363,283
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—171

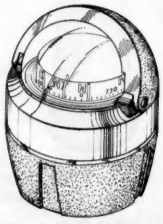
236,090
DISPLAY CASING FOR A CONTAINER
Victor Koenigsberg, Franklin Square, N.Y., assignor to Colgate-Palmolive Co., New York, N.Y.
Filed Dec. 14, 1973, Ser. No. 424,766
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—182



236,091
COMBINED CLOCK HOUSING AND DIAL FACE
Dario D'Adda, Viale Filippetti 33, Milan, Italy
Filed Aug. 14, 1972, Ser. No. 280,283
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—26

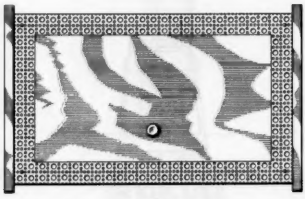


236,092
COMPASS
William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed Jan. 8, 1974, Ser. No. 431,792
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—68



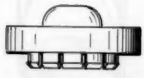
236,093
RADAR REFLECTOR
Hiroshi Ota and Isao Takiguchi, Tokyo, and Matsumi Takahashi, Kawasaki, Japan, assignors to Tokyo Keiki Company Limited, Tokyo, Japan
Filed Apr. 18, 1974, Ser. No. 462,086
Claims priority, application Japan Oct. 23, 1973
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—104

236,094
SMOKE AND GAS DETECTOR
Carlton Swain Moorefield, 4935 Birch Lane, Alexandria, Va. 22308
Filed Apr. 5, 1974, Ser. No. 458,323
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—106

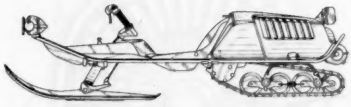


236,095
REFLECTOR
Gerald Golden, Highland Park, Ill., assignor to Beatrice Foods Co., Elgin, Ill.
Filed Aug. 7, 1974, Ser. No. 495,401
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

236,096
AUDIBLE ALARM
Louis P. Sweany, Carmel, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.
Filed Aug. 29, 1973, Ser. No. 392,624
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—116



236,097
SNOWMOBILE
Masahiro Sato, Asaka, and Sadao Mizushima, Tokyo, Japan, assignors to Honda Gyken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 30, 1974, Ser. No. 437,954
Claims priority, application Japan Aug. 1, 1973
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—7

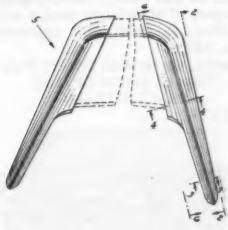


236,098
GOLF CAR
Denis E. Bedel, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Oct. 4, 1973, Ser. No. 403,596
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—16

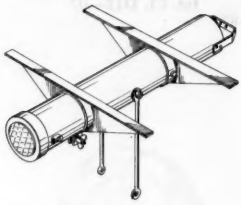
236,099
SAILBOAT
Ervin R. Heald, Los Alamitos, William D. Kelly, Mission Carlsbad, Calif. 92008
Filed Jan. 7, 1974, Ser. No. 431,163
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—64

236,100
AIRPLANE
Ervin R. Heald, Los Alamitos, William D. Kelly, Mission Viejo, Harold F. Kleckner, Los Angeles, Joseph D. Van Dyke, Palos Verdes Estates, and Howell L. Walker, Lakewood, Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.
Filed Apr. 3, 1974, Ser. No. 457,492
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—80

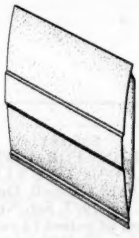
236,101
PAIR OF STANCHIONS FOR A WIND DEFLECTOR FOR AUTOMOTIVE VEHICLES
Frederick A. Helm, 9818 Grinnell, Detroit, Mich. 48213
Filed Dec. 10, 1973, Ser. No. 423,260
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



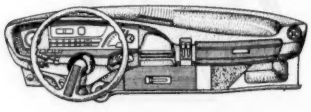
236,102
RACK FOR BICYCLES AND THE LIKE
Donald L. Branscom, 1816 E. Helen St., Apt. 209, Tucson, Ariz. 85719
Filed Mar. 11, 1974, Ser. No. 449,960
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158

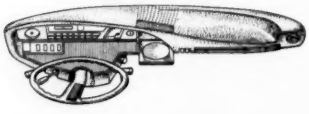


236,103
REAR VAN DOOR
Harrison A. Field, 1201 E. Fairhaven 25, Santa Ana, Calif. 92705
Filed Dec. 10, 1973, Ser. No. 423,163
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—196

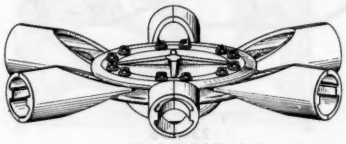


236,104
COMBINED DASHBOARD AND STEERING WHEEL FOR AN AUTOMOBILE
Jean Cadiou, 36 Rue Dailly, Saint Cloud, France
Continuation-in-part of abandoned design application Ser. No. 25,787, Nov. 2, 1970. This application Oct. 31, 1972, Ser. No. 302,547
Claims priority, application France May 6, 1970
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—192

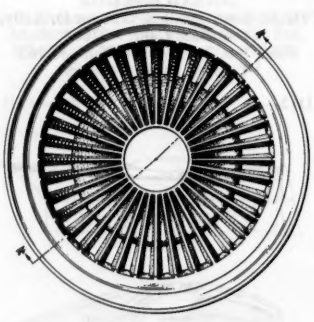




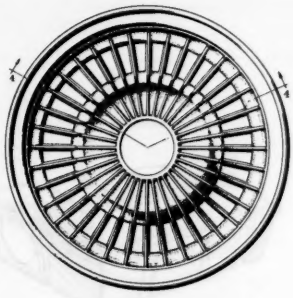
236,105
HUB
Thomas C. Howard, P.O. Box 25549, Raleigh, N.C. 27211
Filed Dec. 17, 1973, Ser. No. 424,933
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—207



236,106
WHEEL
Henry James Clary, Orange, Calif. (16427 S. Avalon Blvd., Gardena, Calif. 90248)
Filed Dec. 17, 1973, Ser. No. 425,286
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

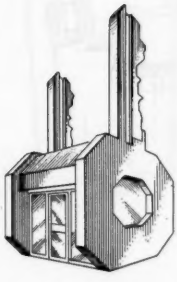


236,107
AUTOMOBILE WHEEL
Delmer D. Scott, Encino, Calif., assignor to Permacast Corp., Compton, Calif.
Filed June 21, 1974, Ser. No. 483,937
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—211

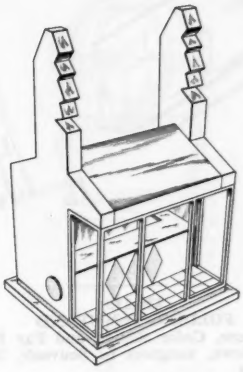


236,108
MODULAR BUILDING
Berne A. Watkins, 76 Cambridge Road, Glenmont, N.Y. 12077
Filed Nov. 4, 1971, Ser. No. 195,904
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 R

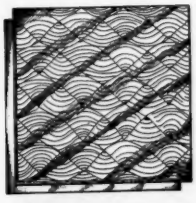
236,109
KEY KIOSK
Thomas R. Moscati, McLean, Va., assignor to Leonard Krol, Cheektowaga, N.Y.
Filed Feb. 1, 1973, Ser. No. 328,595
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 F



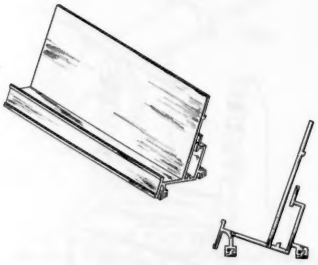
236,110
BUILDING
Anthony P. Moscatelli, 239 N. Queens Ave., Massapequa, N.Y. 11758
Filed Jan. 15, 1974, Ser. No. 433,471
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 F



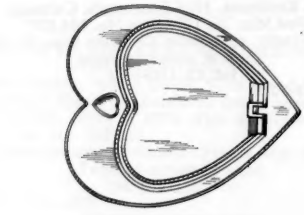
236,111
FLOOR TILE
Otto Kreibaum, 3215 Lauenstein, Germany
Filed Mar. 26, 1973, Ser. No. 344,537
Claims priority, application Germany Sept. 27, 1972
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 B

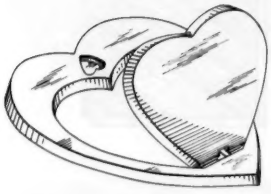


236,112
COOLING RACK FOR ADHESIVE BINDINGS
Henry N. Staats, Deerfield, Ill., assignor to General Binding Corporation, Northbrook, Ill.
Filed Nov. 26, 1973, Ser. No. 419,129
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75

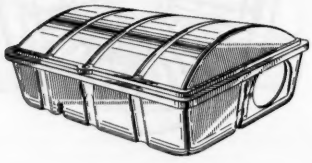


236,113
FOLDING PEN STAND
James G. Moore, Cedar Rapids, and Fay W. Oltman, Anamosa, Iowa, assignors to Souvenir, Inc., Cedar Rapids, Iowa
Filed Jan. 2, 1974, Ser. No. 429,876
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—84

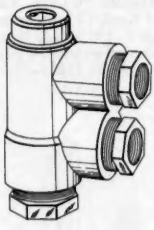




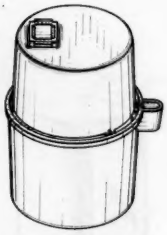
236,114
RODENT BAIT FEEDING BOX OR SIMILAR ARTICLE
Stanley Z. Baker, Cleveland Heights, Ohio, assignor to J. T. Eaton & Company, Cleveland, Ohio
Filed Jan. 21, 1974, Ser. No. 435,271
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—18



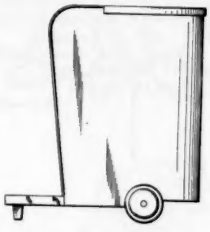
236,115
OILBURNER VALVE OR SIMILAR ARTICLE
Curt Arnold Bjorklund, Box 99, Ulricehamn, Sweden
Filed Mar. 20, 1973, Ser. No. 342,928
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



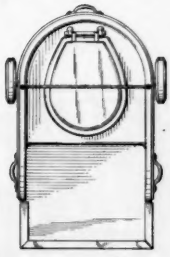
236,116
BALL COCK FLOAT
Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631, and Frederic E. Schmuck, 535 Century Drive, Anaheim, Calif. 92805
Filed Jan. 2, 1974, Ser. No. 429,721
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—33

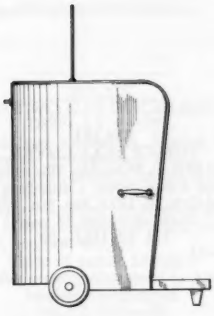


236,117
PORTABLE URINAL
Luther Elkins, 13031 Forest Drive, Bowie, Md. 20716
Filed Aug. 16, 1973, Ser. No. 388,904
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48

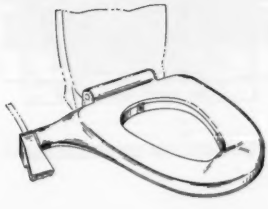


236,118
PORTABLE TOILET
Luther Elkins, 13031 Forest Drive, Bowie, Md. 20716
Filed Apr. 19, 1974, Ser. No. 462,429
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48

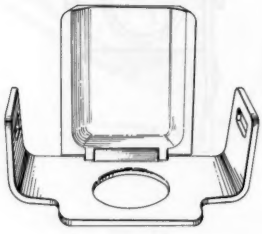




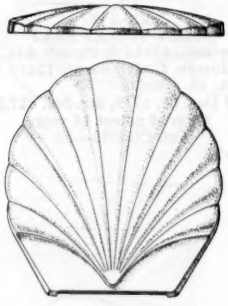
236,119
BIDET TOILET SEAT
Michael F. Slawinski, 12911 S. Parnell Ave., Chicago, Ill. 60628, and Joseph J. Cylkowski, 12412 S. Carpenter, Calumet Park, Ill. 60643
Filed Dec. 26, 1973, Ser. No. 427,566
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71



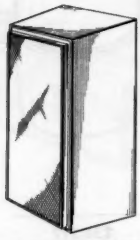
236,120
COMBINED TOILET SEAT AND COVER
Robert O'Neil, Wheaton, Ill., assignor to Beneke Corporation, Columbus, Miss.
Filed Oct. 26, 1973, Ser. No. 409,880
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71



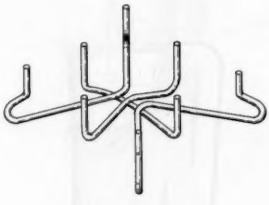
236,121
TOILET SEAT COVER
Robert O'Neil, Wheaton, Ill., assignor to Beneke Corporation, Columbus, Miss.
Filed Oct. 26, 1973, Ser. No. 409,881
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71



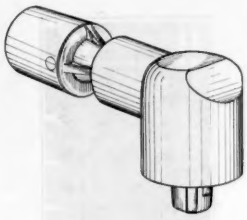
236,122
AIR FRESHENER
Jody L. Numbers, Scottsdale, Ariz., assignor to Envair, Inc., San Antonio, Tex.
Filed Nov. 30, 1973, Ser. No. 420,622
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



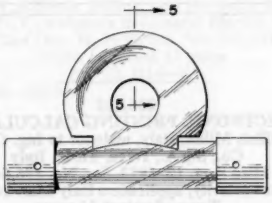
236,123
FIRING TRAY FOR DENTAL PROSTHETICS
Allan L. Brent, Dobbs Ferry, and Harvey Bocian, Jericho, N.Y., assignors to Labco Products, Inc., Jamaica, N.Y.
Filed Sept. 7, 1972, Ser. No. 286,869
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—1 R



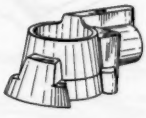
236,124
ELECTRICAL INTERFERENCE SUPPRESSOR FOR INTERNAL COMBUSTION ENGINE IGNITION SYSTEMS
Norman Alfred Jukes, Walsall, England, assignor to Joseph Lucas (Electrical) Limited, Birmingham, England
Filed Mar. 1, 1972, Ser. No. 231,092
Claims priority, application Great Britain Oct. 20, 1971
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 A



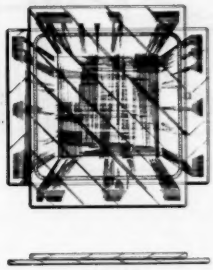
236,125
COMBINED ELECTRIC FUSE BODY AND INTEGRAL HANDLE
Gerald Wiebe, 18W 077 Williamsburg Lane, Villa Park, Ill. 60181
Filed May 4, 1972, Ser. No. 250,482
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 D



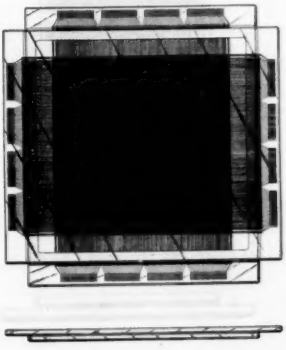
236,126
BATTERY CABLE TERMINAL
James Demetreon, 5704 Hillside Drive, Kansas City, Mo. 64151
Filed Dec. 5, 1973, Ser. No. 421,934
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 E



236,127
LIGHT EMITTING GAS DISCHARGE MATRIX DISPLAY PANEL
Roger E. Ernsthausen, Luckey, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Continuation-in-part of design application Ser. No. 26,650, Dec. 28, 1970, now Patent No. 231,231. This application Dec. 17, 1973, Ser. No. 425,402
Term of patent 14 years
The term of this patent subsequent to Apr. 9, 1988, has been disclaimed
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

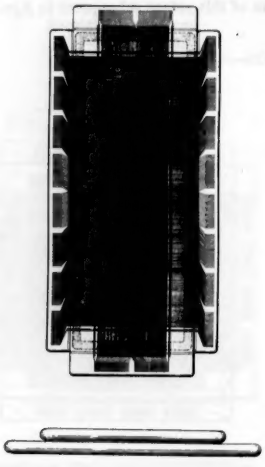


236,128
LIGHT EMITTING GAS DISCHARGE MATRIX DISPLAY PANEL
Gerald E. Wojcik and Richard A. Martel, Toledo, Ohio, Fred E. Mansur, Temperance, Mich., and Larry J. Lohmann, Centerville, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Continuation-in-part of design application Ser. No. 26,304, Dec. 7, 1970, now Patent No. 231,358. This applicatiion Dec. 14, 1973, Ser. No. 425,051
Term of patent 14 years
The term of this patent subsequent to Apr. 16, 1988, has been disclaimed
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

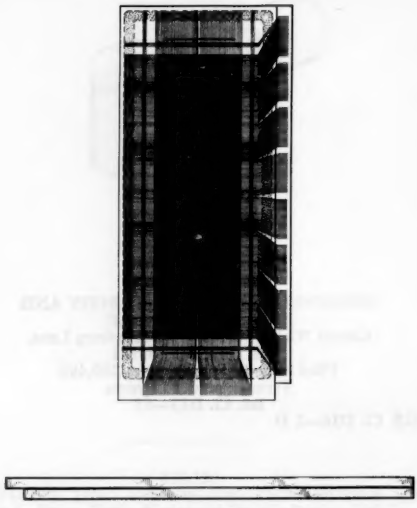


236,129
INPUT/OUTPUT TERMINAL
Loren D. Stirling, Pleasanton, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 3, 1973, Ser. No. 420,827
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

236,130
LIGHT EMITTING GAS DISCHARGE MATRIX DISPLAY PANEL
Fred E. Mansur, Temperance, Mich., and Larry J. Lohmann, Centerville, and Gerald E. Wojcik and Richard A. Martel, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Continuation-in-part of design application Ser. No. 196,863, Nov. 8, 1971, now Patent No. 230,986. This application Dec. 14, 1973, Ser. No. 425,052
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



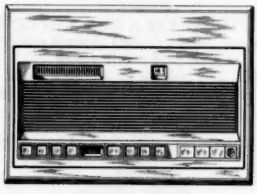
236,131
LIGHT EMITTING GAS DISCHARGE MATRIX DISPLAY PANEL
Fred E. Mansur, Temperance, Mich., and Harold J. Hoehn, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Continuation-in-part of design application Ser. No. 260,688. June 7, 1972, now Patent No. 230,856. This application Dec. 17, 1973, Ser. No. 425,852
Term of patent 14 years
The term of this patent subsequent to Mar. 19, 1988, has been disclaimed
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

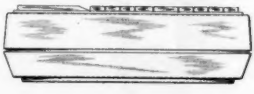


236,132
ELECTRONIC PRINTING CALCULATOR
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & Co., S.p.A., Ivrea, Turin, Italy
Filed Sept. 12, 1973, Ser. No. 396,643
Claims priority, application Italy Mar. 16, 1973
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

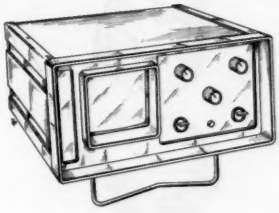
236,133
CONTROL PANEL FOR DATA COMMUNICATION EQUIPMENT OR THE LIKE
Gary M. Kaner, Dallas, Gary C. Merritt, Carrollton, and Barry W. Vaughn, Dallas, Tex., assignors to Carterfone Communications Corporation, Dallas, Tex.
Filed Mar. 8, 1974, Ser. No. 449,386
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

236,134
TELEPHONE ANSWERING DEVICE
Cornelius W. Christie, Fulton, and Reynolds B. Winslow, Syracuse, N.Y., assignors to General Electric Company
Filed Dec. 12, 1974, Ser. No. 531,918
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A





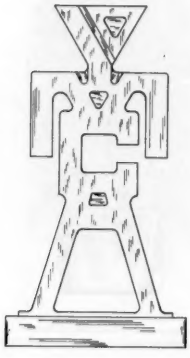
236,135
SLOW SCAN TELEVISION APPARATUS OR THE LIKE
John K. Provost, Babylon, N.Y., assignor to Venus Scientific Inc., Farmingdale, N.Y.
Filed Oct. 11, 1973, Ser. No. 405,320
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 E



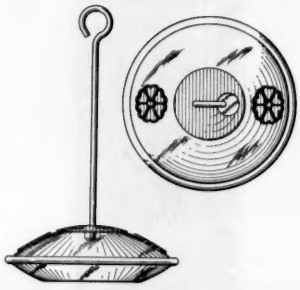
236,136
TELEVISION ANTENNA
Benjamin L. Snyder, Bala Cynwyd, Pa., assignor to Snyder Manufacturing Company, Philadelphia, Pa.
Filed Aug. 15, 1973, Ser. No. 388,647
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 F

236,137
STATUETTE
Sonya Sorel Beliak, 15 Shadow Lane, Larchmont, N.Y. 10538
Filed Aug. 9, 1973, Ser. No. 387,157
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 E

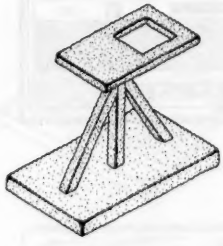
236,138
STATUE
Noel H. Smith, 204 Shamrock, Anniston, Ala. 36201
Filed Nov. 8, 1973, Ser. No. 413,763
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 A



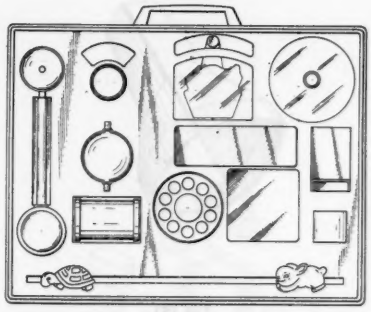
236,139
HUMMINGBIRD FEEDER
Peter Kilham, Barrington, R.I., assignor to Droll Yankees, Inc.
Filed Aug. 6, 1973, Ser. No. 385,906
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



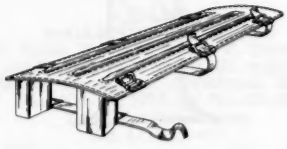
236,140
CAT PERCH AND SCRATCHING POST
William C. Whitlock, 220 12th Ave., Holdrege, Nebr. 68949
Filed July 13, 1973, Ser. No. 378,876
Term of patent 14 years
Int. Cl. D30—*07*
U.S. Cl. D30—42



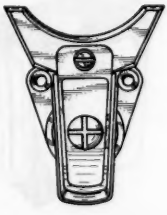
236,141
ACTIVITY TOY
Paul D. Snyder, Allentown, Pa., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 5, 1973, Ser. No. 421,772
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 A



236,142
BOWLING AID
Robert E. Lewis, 2310 W. 72nd St., Shawnee Mission, Kans. 66208
Filed Oct. 11, 1973, Ser. No. 405,446
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 DD

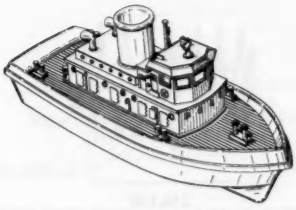


236,143
TOE FIXTURE FOR A SKI SAFETY BINDING
Michio Iizuka, Tokyo, Japan, assignor to Hope Kabushiki Kaisha
Filed Apr. 15, 1974, Ser. No. 460,686
Claims priority, application Japan Oct. 20, 1973
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D



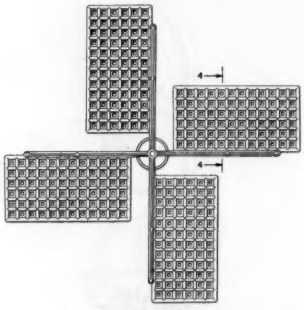
236,144
JOINT FOR A TOY FIGURE
Gotfred Kirk Christiansen, Billund, Denmark, assignor to Interlego A.G., Zug, Switzerland
Filed Apr. 11, 1972, Ser. No. 243,122
Claims priority, application Denmark Oct. 15, 1971
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 GG

236,145
TOY BOAT
Duncan Tong, Hong Kong, assignor to Playart Limited, Hong Kong
Filed Jan. 5, 1973, Ser. No. 321,416
Claims priority, application Great Britain July 11, 1972
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 JJ

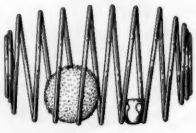


236,146
TOY VEHICLE
Philip F. Seymour, Plymouth, Minn., assignor to Tonka Corporation, Hopkins, Minn.
Filed Dec. 28, 1973, Ser. No. 429,356
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

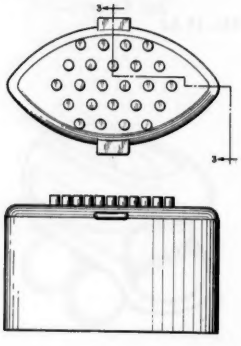
236,147
PIN WHEEL FAN
Lester V. Molenaar, Box 777, W. Highway 40, Willmar, Minn. 56201
Filed Jan. 25, 1974, Ser. No. 436,524
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AP



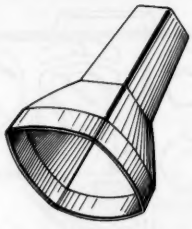
236,148
SOUNDING TOY FOR PET ANIMAL
Samuel Rosenberg, Brooklyn, N.Y., assignor to Excelsior Pet Products, Inc., Brooklyn, N.Y.
Filed July 24, 1973, Ser. No. 382,272
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AG



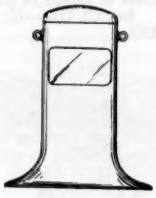
236,149
CAP FOR DRIVABLE FERTILIZER STICK
Jacob Douglas Gay, Jr., Fayette County, Ky. (Pine Grove, Ky. 40470)
Filed July 6, 1973, Ser. No. 377,093
Term of patent 14 years
Int. Cl. D8—*01, 99*
U.S. Cl. D35—1



236,150
LIGHTING FIXTURE HOUSING
William M. Armstrong and Robert E. Gardyne, El Cerrito, and Wallace D. Runswick, Kensington, Calif., assignors to Inlite Corporation, Berkeley, Calif.
Filed Mar. 27, 1974, Ser. No. 455,491
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 D

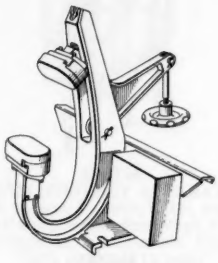


236,151
BOLLARD LIGHT FIXTURE
Marvin Paul Friedberg, New York, N.Y., assignor to Bajer Industries Incorporated, Fairfield, N.J.
Filed June 6, 1974, Ser. No. 476,880
Term of patent 14 years
Int. Cl. D10—*06;* D26—*03*
U.S. Cl. D48—31

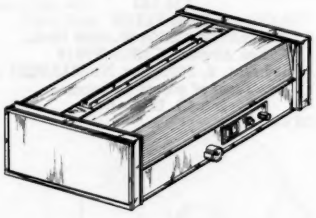


236,152
CLOTHES DRYER
Takeshi Yamamoto, Tokyo, Japan, assignor to Hitachi, Ltd.
Filed Mar. 22, 1972, Ser. No. 237,242
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D49—1 A

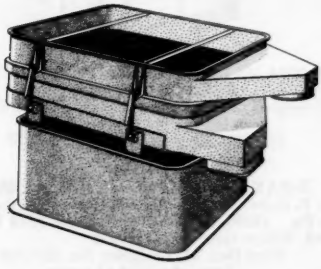
236,153
CLAMP
Derek Hogg and John Fairburn Askam, Sutton Coldfield, England, and Roger Anthony Wilson, Wrexham, Wales, assignors to Dunlop Limited
Filed Nov. 6, 1972, Ser. No. 303,800
Claims priority, application Great Britain May 11, 1972
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D54—13 A



236,154
BOOKBINDING MACHINE
Henry N. Staats, Deerfield, Robert S. Quandt, Lincolnshire, and Viktor Struch, Skokie, Ill., assignors to General Binding Corporation, Northbrook, Ill.
Filed Nov. 30, 1973, Ser. No. 420,689
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1

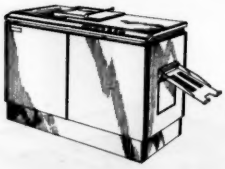


236,155
SCREENING MACHINE
William E. Lower, Cincinnati, Ohio, and Arthur C. Nolte, deceased, late of Cincinnati, Ohio, by Lorraine Nolte, executrix, Cincinnati, Ohio, assignors to Rotex, Inc., Cincinnati, Ohio
Filed Dec. 20, 1973, Ser. No. 426,544
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 D



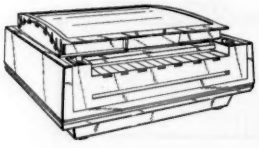
236,156
VIBRAPHONE
Clair O. Musser, 12997 Blairwood Drive, Studio City, Calif. 91604
Filed May 29, 1973, Ser. No. 364,807
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D56—1 E

236,157
COPYING MACHINE
Motoaki Sakamoto and Hisao Uchino, Tokyo, Japan, assignors to Hitachi, Ltd.
Filed July 6, 1973, Ser. No. 377,023
Claims priority, application Japan Jan. 24, 1973
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



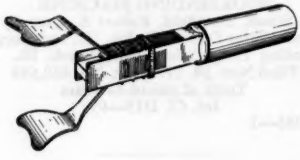
236,158
X-RAY FILM DEVELOPING MACHINE
Henry F. Hope, 3192 Huntingdon Road, Huntingdon Valley, Pa. 19006, and Stephen F. Hope, 2548 Wyandotte Road, Willow Grove, Pa. 19090
Filed Dec. 21, 1973, Ser. No. 427,350
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q

236,159
COPY MACHINE
Roger L. Larson, Roseville, Minn., and Samuel M. Highberger, Bloomfield Township, Mich., assignors to Minnesota Mining and Manufacturing Company
Filed Dec. 21, 1973, Ser. No. 427,044
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



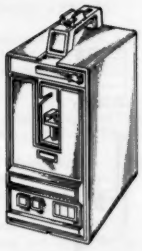
236,160
APPLICATOR FOR A MAGNETIC RECORDING CLIP FOR SLIDES OR THE LIKE
Donald L. Fischer, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company
Filed Nov. 1, 1973, Ser. No. 411,667
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 S

236,161
FACIAL MUSCLE EXERCISER
Ralph E. Welch, 917 Winthorne Drive, Apt. D–26, Nashville, Tenn. 37217
Filed Aug. 24, 1973, Ser. No. 391,060
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D83—1 T

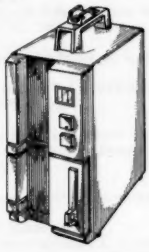


236,162
EAR PLUG
Charles Leight, 5356 W. Pico Blvd., Los Angeles, Calif. 90019
Filed Nov. 8, 1973, Ser. No. 413,913
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 R

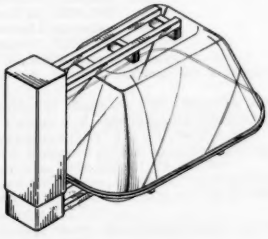
236,163
FLUID DELIVERY APPARATUS
Joseph J. Manno, La Jolla, Calif., assignor to IVAC Corporation, San Diego, Calif.
Filed Sept. 16, 1974, Ser. No. 506,615
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 F



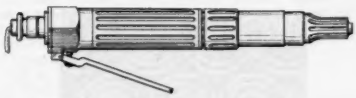
236,164
FLUID DELIVERY APPARATUS
Joseph J. Manno, La Jolla, Calif., assignor to IVAC Corporation, San Diego, Calif.
Filed Sept. 16, 1974, Ser. No. 506,618
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 F



236,165
COMPREHENSIVE INFANT CARE SYSTEM
John W. Beld, O'Fallon, Warren G. Kinninger, Florissant, Robert E. N. Klohr, Fenton, and Paul A. Byrne, St. Louis, Mo., assignors to Puritan-Bennett Corporation, Kansas City, Mo.
Filed Sept. 29, 1972, Ser. No. 293,653
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 G

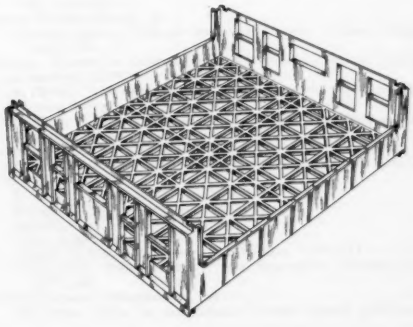


236,166
COMBINED BATTERY POWERED SURGICAL DRILL AND BATTERY CANISTER THEREFOR
Meyer Fishbein, 12020 Saltair Place, Los Angeles, Calif. 90049
Filed Feb. 19, 1974, Ser. No. 443,361
Term of patent 7 years
Int. Cl. D24—*02*
U.S. Cl. D83—12 R

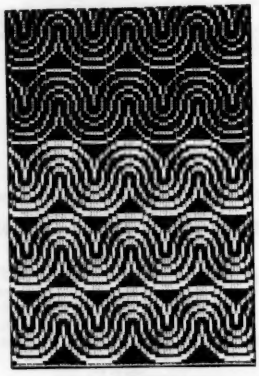


236,167
COMBINED HAIR DETANGLER AND HOLDER THEREFOR
Theodore G. Daher, Stratford, Conn., assignor to General Electric Company
Filed Oct. 1, 1973, Ser. No. 402,034
Term of patent 3½ years
Int. Cl. D28—*03*
U.S. Cl. D86—8

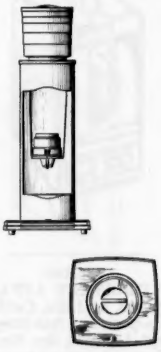
236,168
BAKERY TRAY OR THE LIKE
Lewis T. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed July 19, 1973, Ser. No. 380,592
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D87—1 R



236,169
CURTAIN FABRIC
Peter Eric Schroeder, Oberwil, near Bremgarten, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed Aug. 10, 1973, Ser. No. 387,465
Claims priority, application Germany Feb. 13, 1973
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1 PP



236,170
BEVERAGE DISPENSER OR SIMILAR ARTICLE
Peter Leslie Birrell, South Delta, British Columbia, Canada, assignor to The Cornelius Company, Anoka, Minn.
Filed Oct. 15, 1973, Ser. No. 406,324
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D94—3 B



LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF JULY, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
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A. I. Welders Limited: *See*—
Watson, Geoffrey Walter, 3,896,655.

AB Bofors: *See*—
Johnsson, Stig Arthur; and Hultgren, Karl Sten Rudolf, 3,896,700.

AB Skanska Cementgjuteriet: *See*—
Dahlstrom, Carl Lennart; and Ponton, Tord Richard William, 3,896,885.

Abe, Yoshio: *See*—
Horiguchi, Shojiro; Abe, Yoshio; and Hosoda, Tohoru, 3,897,450.

Abeles, Rodman. Fastener. 3,896,528, Cl. 24-153.00S.

Aberdeen, David: *See*—
Robinson, Michael; Clamp, Frank; Aberdeen, David; and Mobbs, David Barry, 3,897,537.

ACF Industries, Incorporated: *See*—
Wicke, Charles H., 3,896,835.

Ackermann, Werner; and Vollhardt, Frohmut, to SAG Siegener Aktiengesellschaft. Method and device for heating open melting baths, especially galvanizing baths, enameling baths and glass baths. 3,897,202, Cl. 432-26.000.

Ackert, Robert J.: *See*—
Shaughnessy, Reginald N.; Witty, Robert W.; and Ackert, Robert J., 3,897,279.

Adamovske Strojirny Narodni podnik: *See*—
Muselik, Miloslav, 3,896,724.

Adams, Ralph D. Drill feed control. 3,897,166, Cl. 408-14.000.

Adams, Stewart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, to Boots Company Limited, The. Thiaxanthenyl semicarbazides as anti-secretory agents. 3,897,547, Cl. 424-16.000.

Addressograph-Multigraph Corporation: *See*—
See, Gary G., 3,896,721.

Aebli, Horst; Fleck, Fritz; and Schmid, Horst, to Sandoz Ltd. Organic compounds. 3,897,421, Cl. 260-240.100.

Agfa-Gevaert AG: *See*—
Meeussen, Louis Achilles; Helmberger, Josef; and Staddler, Klaus, 3,897,132.

Agnew, James Malcolm, to Coal Industry (Patents) Ltd. Mining equipment. 3,897,110, Cl. 299-45.000.

Aida, Kazuhiko: *See*—
Hamamoto, Yoshito; Shirakawa, Hideo; Aida, Kazuhiko; Omura, Yutaka; Takagi, Tosiaki; Nakao, Kozo; Kawaguchi, Takuo; and Nagai, Haruo, 3,897,477.

Air Process AG: *See*—
Roest, Robert Jacques; and van Ruitenburg, Pieter, 3,896,561.

Airco, Inc.: *See*—
Cibulka, Anthony B., 3,896,800.
Leeds, Morton W.; and Szur, Alex J., 3,897,465.
Russell, James P.; Szur, Alex J.; and Terrell, Ross C., 3,897,502.

Airprocess A.G.: *See*—
Roest, Robert Jacques; and Ruitenberg, Pieter van, 3,896,996.

Ajinomoto Co., Inc.: *See*—
Asai, Soichiro; Tazuke, Hideo; and Kageyama, Hiroo, 3,897,484.
Takizawa, Koichi; and Yoshida, Ryonosuke, 3,897,466.

Akai, Kazuyuki: *See*—
Hayashi, Yukichi; Yokoda, Yutaka; Tamura, Masayuki; Kobayashi, Shinichi; Akai, Kazuyuki; and Sakai, Seiu, 3,896,915.

Akiyama, Hiroshi. Aspirator for removal of the contents of cystic tumors. 3,896,810, Cl. 128-276.000.

Aktiebolaget Leo: *See*—
Hogberg, Knut Bertil; Fex, Hans Jacob; Fredholm, Bo Goran; Perklev, Torsten Rune; and Veige, Sten Gunnar, 3,897,519.

Akzo N. V.: *See*—
Zengel, Hans-Georg; and Bergfeld, Manfred, 3,897,498.

Aladdin Manufacturing Company: *See*—
Wintz, Donald E., 3,896,592.

Albany International Corporation: *See*—
Haller, Herbert C., 3,897,290.

Albert Einstein Medical Center of Philadelphia: *See*—
Leon, Shalom A.; Shapiro, Bernard; and Kollmann, George J., 3,897,212.

Albertsson, Per-Ake, to Pharmacia Fine Chemicals AB. Method of fractionating a mixture of high molecular substances of different physical characteristics. 3,897,414, Cl. 260-211.50R.

Alburger, James R. Enhanced stability water washable penetrant composition and process. 3,896,664, Cl. 73-104.000.

Alcock, Leslie; and Ford, James, to British Petroleum Company, Limited, The. Catalytic reactors. 3,897,220, Cl. 23-288.00R.

Ales, David Edward: *See*—
Holoubek, George Henry; Ales, David Edward; and Harms, Harland Elmer, 3,896,710.

Alexeenko, Vladimir Iosifovich: *See*—
Binzburg, Boris Nisonovich; Smetk'in, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Kaszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 3,897,190.

Alexiev, Boris Vasilev; Stoev, Stoycho Borisov; Spasov, Alexander Vasilev; Maneva, Lilyana Stoilova; Emanuilov, Emanuil Alexandrov; and Golovinski, Evgeni Victorov, to Institute po Biochimia pri Ban. Aminoacid derivatives. 3,897,494, Cl. 260-561.00H.

Alfred Lovgren Byggnads AB: *See*—
Lovgren, Anders, 3,896,558.

Algoma Steel Corporation, Limited, The: *See*—
Shaughnessy, Reginald N.; Witty, Robert W.; and Ackert, Robert J., 3,897,279.

Allabashi, John C., to Hercules Incorporated. Curing hydroxy-terminated prepolymer using anhydride/epoxide curing system. 3,897,514, Cl. 260-836.000.

Allanter Instruments Limited: *See*—
Baxter, Allan, 3,896,784.

Allen, Alvin, to du Pont de Nemours, E. I., and Company. Hydrous oxide coated TiO_2. 3,897,261, Cl. 106-300.000.

Allied Chemical Corporation: *See*—
Hamilton, Brian K.; and Garner, Eugene F., 3,897,285.
Lada, George J., 3,897,229.
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Smith, Bruce T.; and Pacheco, Roger S., 3,897,331.

Allied Colloids Manufacturing Co., Ltd.: *See*—
Field, John R.; and Smalley, Graham, 3,897,333.

Allmanna Svenska Elektriska Aktiebolaget: *See*—
Bjorklund, Anders; Frelin, Bert; and Scott, Sven, 3,896,945.

Alper, Marshall E.: *See*—
Collins, Earl R.; and Alper, Marshall E., 3,896,955.

Alter Licensing Establishment: *See*—
Schertenleib, Francis, 3,896,648.

Aluminum Company of America: *See*—
Meyer, Raymond J.; Simpson, Ford, Jr.; and Boland, Michael P., 3,897,287.
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Alza Corporation: *See*—
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Amchem Products, Inc.: *See*—
Jacques, Albert M. V., 3,897,486.
Waldrum, John E., 3,897,296.

American Air Filter Company, Inc.: *See*—
De Weese, Daniel P.; and Brozenick, Nicholas J., 3,897,046.
Onnen, James H., 3,897,540.

American Can Company: *See*—
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American Color & Chemical Corporation: *See*—
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American Cyanamid Company: *See*—
Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 3,897,483.
Feins, Irvin Ralph; and Yarrington, Robert Murphy, 3,897,365.
Lindsay, Harry Lee; Angier, Robert Bruce; and Curran, William Vincent, 3,897,430.
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Carmello, Robert; Salka, Barry A.; and Corey, Garland G., 3,897,357.
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American Optical Corporation: *See*—
Brandt, Neill M.; Courtemanche, Richard D.; and Johnson, Bruce D., 3,896,657.

Amery, Edward George: *See*—
Goodall, Charles Clifford Owen; and Amery, Edward George, 3,896,719.

Ammon, Werner, to Licentia-Patent-Verwaltungs-G.m.b.H. Navigation method. 3,896,751, Cl. 114-23.000.

Amos, David J., to Westinghouse Electric Corporation. Turbomachine extraction flow guide vanes. 3,897,168, Cl. 415-144.000.

Amos, Homer C., to Brunswick Corporation. Machine for producing a three dimensional lattice. 3,896,747, Cl. 112-2.000.

Amos, Homer C., to Brunswick Corporation. Machine and method for producing a three dimensional lattice. 3,896,750, Cl. 112-222.000.

AMP Incorporated: *See*—
Beinhaur, Ernest Lloyd, 3,897,088.
Reavis, Robert Philmore, Jr., 3,897,128.
Stauffer, Larry Ronald, 3,897,131.
Tucci, John James, 3,896,535.
Ullman, Robert; and Wagner, Earl William, 3,896,533.
Zimmerman, Richard Henry; and Brenneman, Richard Lee, 3,897,246.

Amsted Industries Incorporated: *See*—
Woodburn, James, Jr.; and Lohman, Gordon Russell, 3,897,184.

Anatol, Jesus, to Sucreries du Soissonnais et Compagnie Scuriere. Process for the preparation of α-ketocarboxylic acids. 3,897,467, Cl. 260-406.000.

Anchor Hocking Corporation: *See—*
Forte, Robert L., 3,896,928.

Anderson, Clayton & Co.: *See—*
Sinclair, Stuart Wallace, 3,896,957.

Anderson, Fred J.; and Kessler, Jack L., to Carus Corporation. Recovery and recycle process for anodic oxidation of benzene to quinone. 3,897,319, Cl. 204-78.000.

Anderson, Gerald E.; and Kennedy, Paul R., to Goodyear Tire & Rubber Company, The. Banbury type mixer. 3,897,070, Cl. 277-1.000.

Anderson, Norman R., to Bunker Ramo Corporation. Captivated grounding spring. 3,897,125, Cl. 339-14.00L.

Anderson, Paul S.; Christy, Marcia E.; and Ponticello, Gerald S., to Merck & Co., Inc. Substituted 1,4-dihydro(and 1,2,3,4-tetrahydro)-naphthalen-1,4-imines. 3,897,452, Cl. 260-326.100.

Anderson, Ronald A.; and Tixier, Maurice P., to Schlumberger Technology Corporation. Methods and apparatus for determining characteristics of subsurface earth formations. 3,896,668, Cl. 73-152.000.

Andersson, Sven E. Pilot operated flow control valve. 3,896,840, Cl. 137-219.000.

Andiano, Jose: *See—*
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Anghinetti, Joseph R.; and Couture, Paul A., to Wasco Products, Inc. Hatchway. 3,896,595, Cl. 52-19.000.

Angier, Robert Bruce: *See—*
Lindsay, Harry Lee; Angier, Robert Bruce; and Curran, William Vincent, 3,897,430.

Ango, Alvino J. Automatic chain lubricator for motorcycles and the like. 3,896,901, Cl. 184-15.00R.

Antler Limited: *See—*
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Aoe, Kensei: *See—*
Fujishima, Hiroyasu; Aoe, Kensei; and Ishigaki, Masahiro, 3,896,869.

Aoshima, Shoichi; and Asamaki, Tatsuo, to Nippon Electric Varian, Ltd. Low temperature sputtering device. 3,897,325, Cl. 204-298.000.

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Ariga, Kozo, to Matsushita Electric Industrial Co., Ltd. Apparatus for liquid-phase epitaxial growth. 3,896,765, Cl. 118-412.000.

Armitage, Bernard John: *See—*
Adams, Stewart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, 3,897,547.

Armour, Frank K.; and Touzalin, Robert E., to Interlake, Inc. Coke oven charging system. 3,897,312, Cl. 202-262.000.

Arndt, Edward D., to Bohna Engineering & Research, Inc. Filter assembly having a precompacted filter medium. 3,897,339, Cl. 210-283.000.

Arnold, Howard K.: *See—*
Neidore, Samuel W.; and Arnold, Howard K., 3,896,972.

Aruga, Mitsuo: *See—*
Maeda, Shohe; Yasue, Masayuki; Aruga, Mitsuo; Saito, Sizuo; and Yasunaga, Ikuo, 3,897,544.

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Asai, Soichiro; Tazuke, Hideo; and Kageyama, Hiroo, to Ajinomoto Co., Inc. Mono-alanine maleate. 3,897,484, Cl. 260-501.110.

Asamaki, Tatsuo: *See—*
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Asp, Ingemar B. Automatic sprinkler head. 3,896,880, Cl. 169-39.000.

Astra-Sjuco AB: *See—*
Ekbladh, Fred Vage Gunnar; and Steen, Sven Lennart, 3,896,804.

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Atkins, Norman C., to Citation Companies, Inc., The. Lever operated door latch opener. 3,897,092, Cl. 292-92.000.

Atkinson, Ronald Edward, to Procter & Gamble Company, The. Surface treating compositions containing surface active ammonioamidate compounds. 3,897,348, Cl. 252-8.750.

Atlantic Research Corporation: *See—*
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Auborn, James J., to GTE Laboratories Incorporated. Electrochemical cells. 3,897,265, Cl. 136-6.0LN.

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Audiffred, Sidney J.; Bump, David W.; Erkkila, Raymond N.; Johnson, Lowell E.; and Pearce, Shairyl I., to Caterpillar Tractor Co. Interrelated control for a slipping clutch and associated transmission. 3,896,910, Cl. 192-3.570.

Audouze, Bernard; and Bonometti, Guy. Continuous automatic liquid sampler. 3,896,673, Cl. 73-421.00B.

Auler, Herbert, to Passavant-Werke Michelbacher Huette. Apparatus for aerating liquids in a tank having wave attenuator. 3,897,525, Cl. 261-91.000.

Austin, George K., Jr. Vacuum drain. 3,896,839, Cl. 137-216.100.

Aylott, John F., to Dzus Fastener Co. Inc. Quick release fastener. 3,896,698, Cl. 85-7.000.

Ayres, Waldemar A., to Becton, Dickinson and Company. Plasma separator assembly having interface-seeking piston with centrifugal valve. 3,897,337, Cl. 210-136.000.

Ayres, Waldemar A., to Becton, Dickinson and Company. Serum/-plasma separator assembly with interface-seeking piston having coarse and fine band filters. 3,897,340, Cl. 210-314.000.

Ayres, Waldemar A., to Becton, Dickinson and Company. Plasma separator-hydrostatic pressure type. 3,897,343, Cl. 210-516.000.

B. F. Goodrich Company, The: *See—*
Son, Pyong-Nae; and Baranwal, Krishna C., 3,897,405.

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Babcock, Donald, to Johnson & Johnson. Method for applying adhesive tape tabs to a disposable diaper. 3,897,293, Cl. 156-227.000.

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Bacfree Industries, Inc.: *See—*
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Bachl, Robert; and Naarmann, Herbert, to BASF Aktiengesellschaft. Self-extinguishing thermoplastic molding compositions. 3,897,373, Cl. 260-2.5FP.

Bachmann, Peter, to Ebauches Bettlach S.A. Balance-cock-and-regulator assembly for a timepiece movement. 3,896,614, Cl. 58-109.000.

Badcock, David Norman William, to Kango Electric Hammers Limited. Electric hammer. 3,896,888, Cl. 173-109.000.

Bahlke, Allan R., to FMC Corporation. Constant weight-constant dimension coupling assembly for marine loading arms. 3,896,841, Cl. 137-271.000.

Bahoshy, Bernard J.; Flynn, Charles E.; and Malunis, Gary P., to General Foods Corporation. Chewing gums having longer lasting sweetness and flavor. 3,897,566, Cl. 426-3.000.

Bahre, Karl: *See—*
Krohm, Reinhold; and Bahre, Karl, 3,897,108.

Bailey, Denis M., to Sterling Drug Inc. 2-[α-Alkoxy-arylmethyl]-2-imidazolines and -1,4,5,6-tetrahydropyrimidines. 3,897,431, Cl. 260-251.00R.

Bailey, Escar L.: *See—*
Hunter, Joe S.; Little, Little J.; and Bailey, Escar L., 3,896,619.

Baker Oil Tools, Inc.: *See—*
Crowe, Talmadge L., 3,896,876.

Baker Perkins Holding Limited: *See—*
Edwards, Albert, 3,896,984.

Bakerdrill, Inc.: *See—*
Roscoe, Theodore J., Jr., 3,896,886.

Balazsfai, Albert: *See—*
Binzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Kaszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 3,897,190.

Bald, Robert E.: *See—*
Swanson, Harold V.; and Bald, Robert E., 3,897,073.

Ball, Randell D.; and Buser, Rhoderic D. Machine tool taper protection device. 3,897,159, Cl. 401-9.000.

Banctec, Incorporated: *See—*
Crouse, Ronald J.; LeBrun, Thomas Q.; Sill, Floyd E.; and Volding, Merle J., 3,897,299.

Banker, Gilbert S., to Purdue Research Foundation. Coating apparatus. 3,896,762, Cl. 118-30.000.

Baranwal, Krishna C.: *See—*
Son, Pyong-Nae; and Baranwal, Krishna C., 3,897,405.

Barnes, William R.: *See—*
Werstein, Frank A.; and Barnes, William R., 3,896,599.

Barouh, Victor; and Glenn, Robert. Typewriter ribbon for typing and correcting. 3,896,920, Cl. 197-172.000.

Barragan, Jaime Sahagun. Anti-clogging drip irrigation valve. 3,896,999, Cl. 239-107.000.

Barrett Bros. & Burston & Company Proprietary Limited: *See*—
Horgan, Ronald, 3,897,569.

Barrett, Fred O.: *See*—
Mains, Harold E.; and Barrett, Fred O., 3,897,468.

Barud, Sigvard; and Sedell, Bengt, to Siemens Aktiengesellschaft. Operational table for medical purposes. 3,896,704, Cl. 91-413.000.

BASF Aktiengesellschaft: *See*—
Bachl, Robert; and Naarmann, Herbert, 3,897,373.

Basile, Mario J. Water sealing construction. 3,896,969, Cl. 222-54.000.

Battelle Development Corporation: *See*—
Gurs, Karl, 3,897,590.

Battenberg, Virgil B.: *See*—
Cors, John T.; and Battenberg, Virgil B., 3,897,030.

Baud, Michael: *See*—
Stecker, Glenroy H.; and Baud, Michael, 3,896,669.

Bauer, Friedrich; and Hrabal, Hans, to Hoerbiger Ventilwerke Aktiengesellschaft. Lamellar valves. 3,896,847, Cl. 137-512.150.

Bauman, Harry D.; and Lutz, L. Richmond, III, to P. H. Glatfelter Co. Recovery of papermaking solids for reuse, with an active chlorine-bearing chemical. 3,897,301, Cl. 162-189.000.

Bausch & Lomb Incorporated: *See*—
Wrue, Richard J., 3,896,688.

Bawa, Mohendra S., to Texas Instruments Incorporated. Process for making hyperpure gallium. 3,897,317, Cl. 204-59.00M.

Baxendale, Charles L., to Mechanics, Inc. Hydraulic disc brake. 3,896,907, Cl. 188-72.500.

Baxter, Allan, to Allanter Instruments Limited. Camping stove. 3,896,784, Cl. 126-38.000.

Baxter Laboratories, Inc.: *See*—
Louderback, Allan L.; and Fontana, Anthony J., 3,897,363.
Witty, Michael E., 3,897,002.

Bayer Aktiengesellschaft: *See*—
Blank, Heinz-Ulrich; Wededeyer, Karlfried; and Ebersberger, Josef, deceased, 3,897,321.
Dohm, Heinz; Morgenstern, Karl; Muller, Ludwig; and Wiemers, Rudolf, 3,897,464.
Haupt, Heinrich; Freitag, Dieter; Vernaleken, Hugo; Wagner, Kuno; and Findeisen, Kurt, 3,897,392.
Hocker, Jurgen, 3,897,517.
Horstmann, Harald; Wollweber, Hartmund; and Meng, Karl, 3,897,488.
Huper, Fritz; and Schmidt-Kastner, Gunther, 3,897,409.
Kishino, Shigeo; Yamada, Yasuo; Kurahashi, Yoshio; and Kume, Toyohiko, 3,897,552.
Klauke, Erich; Holtschmidt, Hans; and Findeisen, Kurt, 3,897,495.
Korte, Siegfried; Suling, Carlhans; and Lorenz, Gunter, 3,897,404.
Kricsfalussy, Zoltan; Blocher, Karlheinz; Pawlowski, Juri; Scherhag, Bernhard; and Weiler, Raoul, 3,897,541.
Kuhlthau, Hans-Peter, 3,897,418.
Liebsch, Dietrich; Becher, Dieter; Kress, Rudolf; and Sauer, Heinz, 3,897,314.
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Stolzer, Claus; Hammann, Ingeborg; and Unterstenhofer, Gunter, 3,897,520.
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Bayhi, Joseph Frank: *See*—
Kirby, Robert Andrew; and Bayhi, Joseph Frank, 3,896,898.

Baynes, William R.: *See*—
Hock, Donal D.; Douglas, Raymond J.; and Baynes, William R., 3,897,056.

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Beranek, Jaroslav; Kaspar, Milos; Bazant, Vladimir; and Chladek, Antonin, 3,897,546.

Beavers, Robert Gerald: *See*—
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Liebsch, Dietrich; Becher, Dieter; Kress, Rudolf; and Sauer, Heinz, 3,897,314.

Beck, James R.; and Suhr, Robert G., to Eli Lilly and Company. 2-Cyano-3-nitro-5-trifluoromethyl phenyl thio pyridines. 3,897,440, Cl. 260-294.80G.

Becker, Karl Heinz; Boltze, Karl-Heinz; Dell, Hans-Dieter; and Seidel, Peter-Rudolf, to Troponwerke Dinklage & Company. 1-(3-(amino alkyl)-2-oxo-2H-1-benzopyran-7-yl)-ureas. 3,897,426, Cl. 260-246.00B.

Becker, Otto Alfred. Resistance welding of sheet metal coated with layers. 3,897,593, Cl. 219-92.000.

Beckman Instruments, Inc.: *See*—
Keenan, Charles A.; and Cederstrand, Carl N., 3,897,153.

Becton, Dickinson and Company: *See*—
Ayres, Waldemar A., 3,897,337.
Ayres, Waldemar A., 3,897,340.
Ayres, Waldemar A., 3,897,343.

Beinhaur, Ernest Lloyd, to AMP Incorporated. Sealing boot. 3,897,088, Cl. 285-97.000.

Bell & Howell Company: *See*—
Mischenko, Nicholas, 3,897,025.
Tout, Stanley D., 3,896,603.

Bell Telephone Laboratories, Incorporated: *See*—
Lundstrom, Alexis A.; and Schimpf, Luther G., 3,897,591.

Bellamy, Carlos, to Uniroyal, S.A. Adhesion of metal to rubber. 3,897,583, Cl. 428-256.000.

Bellmann, Gunter G.: *See*—
Groult, Alain Maurice; and Bellmann, Gunter G., 3,897,390.

Belmont, Peter A. Golf club heads and process. 3,897,066, Cl. 273-171.000.

Belot, Pierre; and Perrain, Maurice, to Pont-A-Mousson S.A. Process and device for preheating moulds. 3,897,201, Cl. 432-4.000.

Ben Clements & Sons, Inc.: *See*—
Mato, Laszlo, 3,896,713.

Bender, Heinz; Stachel, Adolf, deceased; by Stachel, Ingeburg Lydia Katharina, heiress; Beyerle, Rudi; Nitz, Rolf-Eberhard; and Scholtholt, Josef, to Cassella Farbwerke Mainkur AG. Basically substituted coumarin derivatives. 3,897,419, Cl. 260-240.00J.

Bendix Corporation, The: *See*—
Birrell, Kirk E., 3,896,940.
Moses, Willy B.; and Moore, Nathaniel N., 3,897,031.

Benefield, Roy W.: *See*—
Grieger, Cecil C.; Benefield, Roy W.; Oliver, Alton D.; and Chronister, Clyde H., 3,896,855.

Beneke, Jene A., to Verson Allsteel Press Co. Two-speed clutch and brake system. 3,896,911, Cl. 192-18.00A.

Beninate, John V.; Daigle, Donald J.; Drake, George L., Jr.; Reeves, Wilson A.; and Donaldson, Darrell J., to United States of America, Agriculture. Fire resistant polymers produced by reacting phenyl isothiocyanate and tris (hydroxymethyl) phosphine. 3,897,398, Cl. 260-77.5AQ.

Benne, James K. Trotline lifter. 3,896,579, Cl. 43-27.400.

Bennett, John P.; and Bliss, George D., to Syntex Inc. Air cane filter device. 3,897,338, Cl. 210-169.000.

Bennett, Robert R.: *See*—
Byerley, Wilbur M.; and Bennett, Robert R., 3,896,770.

Beranek, Jaroslav; Kaspar, Milos; Bazant, Vladimir; and Chladek, Antonin, to Ceskoslovenska akademie ved. Method of cooling or heating fluidized beds. 3,897,546, Cl. 423-659.000.

Berger, Donald E. Anchor plate for fence post. 3,896,596, Cl. 52-153.000.

Bergfeld, Manfred: *See*—
Zengel, Hans-Georg; and Bergfeld, Manfred, 3,897,498.

Bergskoog, Robert C. Stand-out. 3,897,084, Cl. 280-166.000.

Bergstrom, Thomas G. Liquid dispenser. 3,896,977, Cl. 222-353.000.

Beriger, Ernst; and Martin, Henry, to Ciba-Geigy AG. S,S-Dialkyl-O-alkylthioalkyl phosphites and phosphates. 3,897,521, Cl. 260-948.000.

Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, to American Cyanamid Company. Novel 1-acyloxy-2-(omega-carboalkoxyalkyl)cycloalk-1-enes. 3,897,483, Cl. 260-488.00R.

Bernhard, Johann, to Pro Medical Engineering AB. Coupling means for use with blood sampling apparatus. 3,896,853, Cl. 137-614.050.

Berryhill, Bill B.: *See*—
Chaudoir, Charles J.; Cousins, True E.; and Nagy, Kornel, 3,897,160.

Bertanza, Battista, to Powersteering Trust Reg. Arrangement for relieving the mechanical stresses in power assisted steering for vehicles in the full-lock steering positions. 3,896,703, Cl. 91-401.000.

Bertus, Brent J., to Phillips Petroleum Company. Catalyst. 3,897,369, Cl. 252-469.000.

Berz, Wolfgang. Apparatus for separating suspended particles from a carrier gas. 3,897,228, Cl. 55-273.000.

Betamite Electronic Devices: *See*—
Mason, Barry, 3,896,803.

Betz Laboratories, Inc.: *See*—
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, 3,897,554.
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, 3,897,562.

Beukert, Guntram, to Hergeth KG Maschinenfabrik und Apparatebau. Device for feeding fibrous material, especially spinning material, to a processing machine. 3,896,523, Cl. 19-105.000.

Beyer, Reinhardt, to Bison-werke Bahre & Greten GmbH & Co. KG. Apparatus for spreading material serving for the manufacture of fiberboards. 3,897,185, Cl. 425-81.000.

Beyerle, Rudi: *See*—
Bender, Heinz; Stachel, Adolf, deceased; Stachel, Ingeburg Lydia Katharina, heiress; Beyerle, Rudi; Nitz, Rolf-Eberhard; and Scholtholt, Josef, 3,897,419.

Beyl, Jean Joseph Alfred. Longitudinal adjustment device notably for ski bindings. 3,897,076, Cl. 280-11.35T.

Bibb Company, The: *See*—
Kearney, John A., 3,897,206.

Bifano, Natale J.; and Pouchot, Walter David, to United States of America, Energy Research and Development Administration. Mechanical drive for blood pump. 3,896,501, Cl. 3-1.700.

Bigelow, Floyd E., Jr. Connecting apparatus. 3,896,517, Cl. 14-71.000.

Binzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Kaszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, to Bor-, Mubor- es Cipoipari Kutato Intezet; and Vsesojuzny Nauchno Issledovatelsky Institut Plenochnykh Materialov i Iskusstvennoi Kozhi. Press tool for producing microcellular shaped pieces of dimensional accuracy, particularly shoe soles. 3,897,190, Cl. 425-383.000.

Birrell, Kirk E., to Bendix Corporation, The. Part presenter. 3,896,940, Cl. 214-8.50D.

Bison-werke Bahre & Greten GmbH & Co. KG: *See*—
Beyer, Reinhardt, 3,897,185.

Bjorklund, Anders; Frelin, Bert; and Scott, Sven, to Allmanna Svenska Elektriska Aktiebolaget. Bottom dumping railway hopper car. 3,896,945, Cl. 214-63.000.

Black, J. Oliver. Institutional bed. 3,896,512, Cl. 5-17.000.

Black, John O. Convertible swingable chair. 3,897,104, Cl. 297-353.000.

Blakely, Jerald W.: *See—*
Nagele, Immaruel P.; Blakely, Jerald W.; and Vandeventer, Lloyd B., 3,896,63 '

Blank, Heinz-Ulrich; Wededeyer, Karlfried; and Ebersberger, Josef, deceased (by Ebersberger, Thea, heiress), to Bayer Aktiengesellschaft. Process for preparing m-chlorobenzene sulphonyl chloride and m-dichlorobenzene. 3,897,321, Cl. 204-158.0HA.

Bleiman, Claude: *See—*
Van Russelt, Michel; Bleiman, Claude; and Mercier, Jean, 3,897,385.

Bliss, George D.: *See—*
Bennett, John P.; and Bliss, George D., 3,897,338.

Blocher, Karlheinz: *See—*
Kricsfalussy, Zoltan; Blocher, Karlheinz; Pawlowski, Juri; Scherhag, Bernhard; and Weiler, Raoul, 3,897,541.

Blumenfeld, Samuel M., to General Electric Company. High aspect ratio P-N junctions by the thermal gradient zone melting technique. 3,897,277, Cl. 148-1.500.

Bochumer Eisenhutte Heintzmann & Co.: *See—*
Spies, Klaus; and Neeff, Joachim, 3,896,626.

Bockemuhl, Ulrich, to Spritzguss-Werk Ludenscheid G.m.b.H. Display packaging unit for packaging and displaying small parts. 3,896,933, Cl. 206-469.000.

Bodor, Nicolae S.; and Kaminski, James J., to Interx Research Corporation. 3-Chloro-tetrahydro-1,3-oxazines or oxazolidines. 3,897,425, Cl. 260-244.00R.

Boehringer Mannheim GmbH: *See—*
Lange, Hans; Rittersdorf, Walter; and Rey, Hans-Georg, 3,897,214.

Boeing Company, The: *See—*
Doellner, O. Leonard, 3,897,028.
Harding, David G.; Schneider, John J.; and Mead, Lawrence M., Jr., 3,897,033.

Boettcher, Walter F. H. Toy. 3,896,583, Cl. 46-47.000.

Bohna Engineering & Research, Inc.: *See—*
Arndt, Edward D., 3,897,339.

Boiko, Georgy Alexandrovich: *See—*
Medovar, Boris Izrailevich; Dubinsky, Rudolf Solomonovich; Boiko, Georgy Alexandrovich; Marinsky, Georgy Sergeevich; and Egorov, Sergei Petrovich, 3,896,878.

Boland, Michael P.: *See—*
Meyer, Raymond J.; Simpson, Ford, Jr.; and Boland, Michael P., 3,897,287.

Bolcskei, Erno: *See—*
Binzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Kaszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 3,897,190.

Bolger, Stephen R. Heat exchanger for gas turbine engines. 3,896,875, Cl. 165-86.000.

Bolick, Fred C., Jr., to Lanier Electronic Laboratory, Inc. Tape winding apparatus. 3,897,027, Cl. 242-195.000.

Bolsing, Friedrich; and Mencke, Heinrich. Method of uniformly distributing substances in a carrier material and pulverous carrier material. 3,897,238, Cl. 71-3.000.

Boltze, Karl-Heinz; Brendler, Otfried; Dell, Hans-Dieter; and Jacobi, Haireddin, to Troponwerke Dinklage & Company. Novel 2-(3-trifluoromethylanilino)-benzoic acid compounds. 3,897,482, Cl. 260-472.000.

Boltze, Karl-Heinz: *See—*
Becker, Karl Heinz; Boltze, Karl-Heinz; Dell, Hans-Dieter; and Seidel, Peter-Rudolf, 3,897,426.

Bongaards, Donald J.; and Giardina, A. Robert, to Westinghouse Electric Corporation. Support system for serpentine tubes of a heat exchanger. 3,896,874, Cl. 165-82.000.

Bonometti, Guy: *See—*
Audouze, Bernard; and Bonometti, Guy, 3,896,673.

Bonta, Simonn: *See—*
Crounse, Nathan N.; Bonta, Simonn; and Ploss, Charles J., 3,897,496.

Boots Company Limited, The: *See—*
Adams, Stewart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, 3,897,547.
Sharpe, Christopher James, 3,897,443.

Bor-, Mubor- es Cipoipari Kutato Intezet: *See—*
Binzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Kaszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 3,897,190.

Borg-Warner Corporation: *See—*
Scohy, John M.; Cremeans, George E.; and Luttinger, Manfred, 3,897,378.

Borgman, Robert J.: *See—*
Kohls, James P.; Borgman, Robert J.; and Campbell, Frederic W., 3,896,892.

Boriskin, Nikolai Vasilievich: *See—*
Cherny, Anatoly Alexeevich; Grachev, Vladimir Alexandrovich; Kirin, Evgeny Mikhailovich; Gorelov, Nikolai Andreevich; and Boriskin, Nikolai Vasilievich, 3,897,049.

Borovina, Anton; and Grattan, Henry E. Heat recovery system for space heating and for potable water heating. 3,896,992, Cl. 237-19.000.

Borrelo, Sebastian R.; and Sawyer, Jimmy D., to Texas Instruments Incorporated. Process for fabricating schottky barrier phototransistor. 3,897,275, Cl. 148-1.500.

Bosse, Frank, to Windmoller & Holscher. Process of manufacturing block bottom bags. 3,896,714, Cl. 93-35.0SB.

Bossert, Friedrich: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,897,462.

Bouchard, Andre C.: *See—*
Jirmanus, Naila Saba; Rindone, Guy E.; and Bouchard, Andre C., 3,897,197.

Boucher, Raymond W.; and Hand, Russell D., to Hedstrom Co. Foldable infant's crib. 3,896,513, Cl. 5-99.00R.

Boucherie, Lionel P., to G. B. Boucherie, Firma. Device for the stepwise displacement of working parts for brush manufacturing machines. 3,896,678, Cl. 74-116.000.

Bourgeois, Michel: *See—*
Guilhem, Jacques; and Bourgeois, Michel, 3,896,961.

Bousquet, Gilles: *See—*
Rambert, Andre; and Bousquet, Gilles, 3,896,500.

Bouyoucos, John V., to Hydroacoustics, Inc. Hydroacoustic apparatus. 3,896,889, Cl. 173-120.000.

Bowden, Charles J.: *See—*
Smith, William E.; and Bowden, Charles J., 3,896,618.

Boyle, Robert F., to Prab Conveyors, Inc. Universal transfer device. 3,896,681, Cl. 74-526.000.

Bozzato, Giuliano; Pesaro, Mario; Schudel, Peter; Hug-Inderbitzin, Marianne; and Erickson, Robert Edward, to Givaudan Corporation. Novel noreremophilane derivatives. 3,897,504, Cl. 260-617.00F.

BP Chemicals International Limited: *See—*
Sturt, Alan Charles, 3,897,408.

Bradatsch, Edmund: *See—*
Lau, Gunther; Bradatsch, Edmund; Brandl, Hermann J.; and Niggel, Georg, 3,896,763.

Bradley, William S.: *See—*
Seitzer, Walter H.; and Bradley, William S., 3,896,557.

Brandl, Hermann J.: *See—*
Lau, Gunther; Bradatsch, Edmund; Brandl, Hermann J.; and Niggel, Georg, 3,896,763.

Brandt, Neill M.; Courtemanche, Richard D.; and Johnson, Bruce D., to American Optical Corporation. Vertical impact tester. 3,896,657, Cl. 73-12.000.

Brandt, Robert H., to Henry Manufacturing Co., Inc. Liquid coolant treating process and apparatus. 3,897,335, Cl. 210-71.000.

Brasile, Leland J.: *See—*
Dopke, James A.; and Brasile, Leland J., 3,896,683.

Brauns, Frank; and Jones, James B., to Novatronics, Inc. Automated sewing apparatus. 3,896,749, Cl. 112-121.120.

Breford, Glenn H., to Midway Industries, Inc. Pin box. 3,897,086, Cl. 280-438.00R.

Brendler, Otfried: *See—*
Boltze, Karl-Heinz; Brendler, Otfried; Dell, Hans-Dieter; and Jacobi, Haireddin, 3,897,482.

Brenneman, Richard Lee: *See—*
Zimmerman, Richard Henry; and Brenneman, Richard Lee, 3,897,246.

Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. [(Azidomethyl)thio]acetylcephalosporins. 3,897,422, Cl. 260-243.00C.

Breuer, Hermann: *See—*
Treuner, Uwe D.; and Breuer, Hermann, 3,897,423.

Brewster, Phillip W., to Exxon Research and Engineering Company. Sludge inhibitor for hydrocarbon oils. 3,897,456, Cl. 260-340.200.

Bridges, William B.; Edlun, William O.; and Hill, James C., to Hughes Aircraft Company. Scanned laser imaging and ranging system. 3,897,150, Cl. 356-5.000.

Bridgestone Tire Company Limited: *See—*
Ishii, Michio; Watabe, Yoji; and Iseda, Yutaka, 3,897,396.
Takei, Atsuo; Nagaoka, Isao; and Tsunoda, Shozo, 3,896,964.

Briesofsky, Gunter: *See—*
Eich, Edmund; and Briesofsky, Gunter, 3,896,938.

Brink, Robert H., Jr.: *See—*
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, 3,897,554.
Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, 3,897,562.

Brinkmeier, Friedhelm, to Windmoller & Holscher. Process and apparatus for manufacturing block bottom bags from heat-sealable material. 3,896,709, Cl. 93-35.0SB.

Bristol-Myers Company: *See—*
Naito, Takayuki; and Nakagawa, Susumu, 3,897,412.

Bristow, Norman William: *See—*
Adams, Stewart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, 3,897,547.

British Oxygen Company Limited, The: *See—*
McGrath, John Alan, 3,896,794.

British Petroleum Company, Limited, The: *See—*
Alcock, Leslie; and Ford, James, 3,897,220.

British Secretary of State for Defence: *See—*
Colliver, David John; and Gibbs, Stephen Edwin, 3,896,543.

Brochon, Jack E.: *See—*
Frances, Andre L.; and Brochon, Jack E., 3,897,126.

Brockschmidt, Karl: *See*—
Klein, Georg; Rossler, Kurt; Brockschmidt, Karl; and Rettweiler, Horst, 3,897,019.

Brode, George Lewis; and Kawakami, James Hajime, to Union Carbide Corporation. Polyamide-imides. 3,897,497, Cl. 260-571.000.

Broecker, Bernhard; and Plettner, Wolfram, to Reichold-Albert-Chemie Aktiengesellschaft. Process for the manufacture of synthetic resins with urethane groups, which also contain carboxyl groups and can be diluted with water. 3,897,377, Cl. 260-18.0TN.

Bromer, William W., to Eli Lilly and Company. Iodoglucagons and process for prolonging the biological activity of glucagon. 3,897,551, Cl. 424-177.000.

Brooks, Norman Darrell. Cutter insert spindle. 3,896,532, Cl. 29-105.00R.

Brouwer, Charles William, to Leesona Corporation. Integrated modular fluid logic arrays displaying dynamic circuit operating conditions. 3,896,851, Cl. 137-557.000.

Brown, John Vincent, to Fosroc A.G. Anchoring. 3,896,627, Cl. 61-45.00B.

Brown, Melancthon S., deceased; and by Kohn, Gustave K., special administrator, to Chevron Research Company. N-alkylthio-N-alkyl aryl carbamates as insecticides. 3,897,561, Cl. 424-300.000.

Brown, Melancthon S., deceased: *See*—
Kohn, Gustave K.; Brown, Melancthon S., deceased; and Kohn, Gustave K., special administrator, 3,897,463.

Brown, Melvin; Menapace, Henry R.; and Maly, Neil A., to Goodyear Tire & Rubber Company, The. Olefin dimerization process. 3,897,512, Cl. 260-683.15D.

Brozenick, Nicholas J.: *See*—
De Weese, Daniel P.; and Brozenick, Nicholas J., 3,897,046.

Brunner, Norman E.: *See*—
Pecoraro, Joseph K.; Deckowitz, Philip A.; and Brunner, Norman E., 3,896,871.

Brunswick Corporation: *See*—
Amos, Homer C., 3,896,747.
Amos, Homer C., 3,896,750.

Brusca, Donald R.: *See*—
Li, Norman N.; Brusca, Donald R.; and Mohan, Raam R., 3,897,308.

Bryngdahl, Olof, to Xerox Corporation. Polarization-grating moire. 3,897,136, Cl. 350-159.000.

Buchalter, Gilbert. Article impregnated with skin-care formulations. 3,896,807, Cl. 128-261.000.

Buchegger, Joachim: *See*—
Ludszeweit, Dieter; and Buchegger, Joachim, 3,896,820.

Bucur, Ionel, to Petersson, Bengt O. Apparatus for mechanical stimulation of the heart. 3,896,797, Cl. 128-53.000.

Bump, David W.: *See*—
Audiffred, Sidney J.; Bump, David W.; Erkkila, Raymond N.; Johnson, Lowell E.; and Pearce, Shairyl I., 3,896,910.

Bunker Ramo Corporation: *See*—
Anderson, Norman R., 3,897,125.

Burd, Samuel: *See*—
Fettel, Bruce E.; and Burd, Samuel, 3,896,815.

Burke, Patrick Michael, to du Pont de Nemours, E. I., and Company. Alkyl and haloalkyl N,N-dialkyl-N-methylolphosphorodiamidates. 3,897,522, Cl. 260-953.000.

Burrows, John: *See*—
Harris, Arthur; Burrows, John; and Jones, Thomas Ivor, 3,897,209.

Busch, Wolfram; Gilfrich, Hans Paul; Scholz, Albrecht; and Wallhauber, Hermann, to Hoechst Aktiengesellschaft. Moulding compositions containing phosphorous, talc, and, optionally, metal carbonate as fillers. 3,897,384, Cl. 260-40.00R.

Buser, Rhoderic D.: *See*—
Ball, Randell D.; and Buser, Rhoderic D., 3,897,159.

Busweiler, Walter, to Metallgesellschaft Aktiengesellschaft. Polycondensation reactor. 3,897,218, Cl. 23-285.000.

Butler, Bryan V., to Vetco Offshore Industries, Inc. Riser pipe and guide line tensioning apparatus. 3,897,045, Cl. 254-172.000.

Bydalek, Andrzej; Romankiewicz, Ferdynand; Romer, Jan; and Tomasik, Edmund, to Politechniko Wroclawska. Method of regeneration of solder, particularly of tin-lead solders, and an apparatus for application the method. 3,897,336, Cl. 210-71.000.

Byerley, Wilbur M.; and Bennett, Robert R., to Westinghouse Electric Corporation. Steam generator with split flow preheater. 3,896,770, Cl. 122-32.000.

Calderon, Alberto Alvarez. Variable camber multi-slotted flaps. 3,897,029, Cl. 244-42.0CA.

Caldow, Douglas. Adjustable climbing apparatus. 3,897,055, Cl. 272-60.00R.

Caldwell, Edward Neal. System for promoting plant growth. 3,896,586, Cl. 47-28.000.

California Institute of Technology: *See*—
Collins, Earl R.; and Alper, Marshall E., 3,896,955.

Camp, William S.; and Magnant, Kenneth K., to United States of America, Army. Ultrasonic measuring device. 3,896,662, Cl. 73-67.80S.

Campagnolo, Tullio. Device for hanging clothes, such as trousers or skirts. 3,896,980, Cl. 223-95.000.

Campbell, Frederic W.: *See*—
Kohls, James P.; Borgman, Robert J.; and Campbell, Frederic W., 3,896,892.

Canno, Leonard E., to Equitable Bag Co., Inc. Bag dispensing package. 3,896,966, Cl. 221-63.000.

Cannon Inc.: *See*—
Goel, Pierre, 3,896,665.

Canon Kabushiki Kaisha: *See*—
Kano, Ichiro, 3,897,138.
Suzaki, Kuniyoshi; Shigeta, Yoshihiro; and Yamanaka, Torakiyo, 3,897,026.

Capelle, Michel F.; and Pinson, Claude, to Societe Anonyme: Poclain. Devices for feeding fluid under pressure to at least two load circuits. 3,897,174, Cl. 417-216.000.

Capitol Reproductions, Inc.: *See*—
Zeunen, Barthel; Grace, Rex C.; and Dunn, Alvie R., 3,897,149.

Carasso, Daniel, to Compagnie Gervais-Danone. Apparatus for expanding food products. 3,896,716, Cl. 99-452.000.

Carborundum Company, The: *See*—
Economy, James; and Smith, William D., 3,897,542.
Rine, James C., 3,896,593.
Sypitkowski, James R., 3,896,848.

Carella, Richard F. Arrow holder. 3,896,782, Cl. 124-41.00A.

Carlson, Paul O., to General Foods Corporation. Syrup and method of manufacturing same. 3,897,262, Cl. 127-55.000.

Carmello, Robert; Salka, Barry A.; and Corey, Garland G., to American Home Products Corporation. Bacteriostatic toilet bowl cleaner compositions. 3,897,357, Cl. 252-106.000.

Carpenter, Richard G., to Crane Co. Bearing wear detector. 3,897,116, Cl. 308-1.00A.

Carr, Ronald R.; and Nisevich, Stephen D., to Union Carbide Corporation. Altering the appearance of corundum crystals. 3,897,529, Cl. 264-65.000.

Carreira, Leonard M., to Xerox Corporation. Imaging system. 3,897,143, Cl. 355-3.00P.

Carson, Howard: *See*—
Miltenburg, Edward W.; Whetstine, Donald L.; and Carson, Howard, 3,896,891.

Cartridge Actuated Devices, Inc.: *See*—
Sawyer, Robert H., 3,896,621.

Caruolo, Antonio B.; and Walch, Allan P., to United Aircraft Corporation. Adjustable mounting apparatus. 3,897,139, Cl. 350-288.000.

Carus Corporation: *See*—
Anderson, Fred J.; and Kessler, Jack L., 3,897,319.

Casey, Thomas P., to J. I. Case Company. Anti-backlash attachment mounting. 3,896,884, Cl. 172-776.000.

Cassella Farbwerke Mainkur AG: *See*—
Bender, Heinz; Stachel, Adolf, deceased; Stachel, Ingeburg Lydia Katharina, heiress; Beyerle, Rudi; Nitz, Rolf-Eberhard; and Scholtholt, Josef, 3,897,419.
Weckler, Gerhard; and Mildenberg, Rolf, 3,897,207.

Caterpillar Tractor Co.: *See*—
Audiffred, Sidney J.; Bump, David W.; Erkkila, Raymond N.; Johnson, Lowell E.; and Pearce, Shairyl I., 3,896,910.
DeGeeter, Robert L.; and Schubert, George E., 3,897,115.
Freeman, William H., 3,896,537.
Holmstrom, William L., 3,896,707.
Kraina, Jack H., 3,896,617.
Scholl, Rolland D., 3,896,899.
Vinton, David S., 3,896,894.

Catlin, Francis D., to Hardinge Brothers, Inc. Taper turning attachment. 3,896,689, Cl. 82-17.000.

Cederstrand, Carl N.: *See*—
Keenan, Charles A.; and Cederstrand, Carl N., 3,897,153.

Celanese Corporation: *See*—
Stackman, Robert W.; and Sargent, Donald W., 3,897,402.

Central Soya Company, Inc.: *See*—
Pass, Darryl W., 3,897,574.

Centre d'Etudes pour l'Industrie Pharmaceutique: *See*—
Sauter, Friedrich, 3,897,427.

Cerro, Daniel Anthony. Shell holder accessory device. 3,896,699, Cl. 86-44.000.

Ceskoslovenska akademie ved: *See*—
Beranek, Jaroslav; Kaspar, Milos; Bazant, Vladimir; and Chladek, Antonin, 3,897,546.
Marek, Miroslav; Toman, Ludek; and Pecka, Jan, 3,897,322.
Wichterle, Otto, 3,896,806.

Ceskoslovenska akademie ved No. 3 Narodni: *See*—
Stoy, Vladimir; Stoy, Artur; Urbanova, Renata; Prokop, Jaroslav; and Kucera, Josef, 3,897,382.

Chafetz, Harry; and Sung, Rodney L., to Texaco Inc. Sulfurized nitrated alkylphenol salts and lubricant compositions thereof. 3,897,352, Cl. 252-42.700.

Chamlin, Matthew D.: *See*—
Kozlowski, Edward C.; and Chamlin, Matthew D., 3,896,991.

Chandler, Roger E., to Exxon Research and Engineering Company. Gasoline containing ashless dispersant. 3,897,224, Cl. 44-71.000.

Chang, Dall Chin. Polyhedral, porous, and hollow block. 3,896,624, Cl. 61-4.000.

Chapman, Harvey W., to Evans Products Company. Freight carrying device. 3,896,741, Cl. 105-368.00R.

Chasson, Leon H., to Atmospheric Sciences, Incorporated. Structure for measuring the average diameter of an approximately circular cross-section of an object. 3,897,156, Cl. 356-157.000.

Chaudoir, Charles J.; Cousins, True E.; and Nagy, Kornel, to Berryhill, Bill B.; and Torres, Carlos A., part interest to each. Pencil apparatus. 3,897,160, Cl. 401-56.000.

Chayes, Norman Chanine; and Kochey, Edward Leslie, Jr., to Combustion Engineering, Inc. Spacer and guide assembly for vertical superheater tubes. 3,896,771, Cl. 122-510.000.

Cheng, Paul J., to Phillips Petroleum Company. Carbon black production process and reactor. 3,897,217, Cl. 23-259.500.

Cherny, Anatoly Alexeevich; Grachev, Vladimir Alexandrovich; Kirin, Evgeny Mikhailovich; Gorelov, Nikolai Andreevich; and Boriskin, Nikolai Vasilievich. Mixer for metal superheating. 3,897,049, Cl. 266-39.000.

Chevalier, Marcel, to Etablissements M. Chapais. Automatic device for presenting bags onto a bagging machine previous to the closing of said bags. 3,896,605, Cl. 53-266.000.

Chevron Research Company: *See—*
Brown, Melancthon S., deceased; and Kohn, Gustave K., special administrator, 3,897,561.
Cleveland, James D., 3,897,481.

Chikazoe, Yoshihisa: *See—*
Tugukuni, Hideyoshi; Kano, Masafumi; and Chikazoe, Yoshihisa, 3,897,381.

Childree, Herman T., to Howe-Baker Engineers, Inc. Cyclonic multi-fuel burner. 3,897,200, Cl. 431-243.000.

Chisso Corporation: *See—*
Shirai, Isoo; Suzuki, Takeshi; and Tonooka, Koichi, 3,897,407.

Chladek, Antonin: *See—*
Beranek, Jaroslav; Kaspar, Milos; Bazant, Vladimir; and Chladek, Antonin, 3,897,546.

Chr. Hansen's Laboratory, Inc.: *See—*
Porubcan, Randolph S.; and Sellars, Robert L., 3,897,307.

Christensen, Lawrence B. Arrowhead. 3,897,062, Cl. 273-106.50B.

Christenson, Roger M.: *See—*
Dowbenko, Rostyslaw; and Christenson, Roger M., 3,897,295.

Christian, Anthony J. Multi purpose bedroom hanger. 3,896,937, Cl. 211-86.000.

Christiansen, Paul; Hofmann, Walter A.; and Muller, Werner, to Hayes-Albion Corporation. Knitting machine actuators. 3,896,639, Cl. 66-50.00R.

Christy, Marcia E.: *See—*
Anderson, Paul S.; Christy, Marcia E.; and Ponticello, Gerald S., 3,897,452.

Chronister, Clyde H.: *See—*
Grieger, Cecil C.; Benefield, Roy W.; Oliver, Alton D.; and Chronister, Clyde H., 3,896,855.

Chronister Development, Inc.: *See—*
Grieger, Cecil C.; Benefield, Roy W.; Oliver, Alton D.; and Chronister, Clyde H., 3,896,855.

Chudley, William Henry: *See—*
Farrow, Harold Frederick; and Chudley, William Henry, 3,896,723.

Chugai Seiyaku Kabushiki Kaisha: *See—*
Omura, Satoshi; Umezawa, Iwao; Hata, Toju; Shindo, Minoru; Mizoguchi, Masakazu; Oi, Nobuhiro; and Uchiyama, Tomoharu, 3,897,428.

Ciba-Geigy AG: *See—*
Beriger, Ernst; and Martin, Henry, 3,897,521.
Martin, Henry, 3,897,242.

Ciba-Geigy Corporation: *See—*
Frey, Christoph, 3,897,439.
Goschke, Richard, 3,897,436.
Haas, Georges; and Sallmann, Alfred, 3,897,437.
Harris, Arthur; Burrows, John; and Jones, Thomas Ivor, 3,897,209.
Mory, Rudolf; and Muller, Rolf, 3,897,411.
Pissiotas, Georg, 3,897,474.

Cibulka, Anthony B., to Airco, Inc. Method and apparatus for triggering the inspiratory phase of a respirator. 3,896,800, Cl. 128-145.800.

Cincinnati Biomedical, Inc.: *See—*
Miller, Gale W.; and Geraci, James L., 3,896,527.

Citation Companies, Inc., The: *See—*
Atkins, Norman C., 3,897,092.

Clamp, Frank: *See—*
Robinson, Michael; Clamp, Frank; Aberdeen, David; and Mobbs, David Barry, 3,897,537.

Clark Equipment Company: *See—*
Hancock, James E., 3,896,568.
Patton, Jon R., 3,896,705.

Clark, June G. Reproduction of the original hair. 3,896,821, Cl. 132-5.000.

Clayton, Robert W.: *See—*
Converse, Vernon G., III; Clayton, Robert W.; and Westervelt, James T., 3,896,670.

Cleveland, James D., to Chevron Research Company. N-carbalkoxyalkyldithio ureas. 3,897,481, Cl. 260-470.000.

Cleveland Vibrator Company, The: *See—*
Crewse, John L., 3,896,701.

Clevett, Merton L., to Solar Products Corporation. Solar stove. 3,896,786, Cl. 126-270.000.

Cloud, Sidney C. Magnetic tire chain installing device. 3,896,687, Cl. 81-15.800.

Coal Industry (Patents) Ltd.: *See—*
Agnew, James Malcolm, 3,897,110.

Cohen, Richard J., to Lawrence Peska Associates, Inc., a part interest. Bridge construction set. 3,896,582, Cl. 46-17.000.

Coker, James Newton, to du Pont de Nemours, E. I., and Company. Polymer coated pigment particles and a process for their preparation. 3,897,586, Cl. 428-403.000.

Cole, Judson C., to Continental Industries, Inc. Combination punch and valve tee fitting. 3,896,842, Cl. 137-318.000.

Coleman Company, Inc., The: *See—*
Nagele, Immanuel P.; Blakely, Jerald W.; and Vandeventer, Lloyd B., 3,896,634.

Collin, Herbert S. Washing machine agitator brace. 3,896,930, Cl. 206-320.000.

Collins, Earl R.; and Alper, Marshall E., to California Institute of Technology. Automated multi-level vehicle parking system. 3,896,955, Cl. 214-16.1CB.

Colliver, David John; and Gibbs, Stephen Edwin, to British Secretary of State for Defence. Semiconductor device encapsulation packages and arrangements and methods of forming the same. 3,896,543, Cl. 29-580.000.

Colombo, Paolo; and Galliverti, Marco, to Societa' Italiana Resine S.I.R. S.p.A. Process for the preparation of catalysts for the polymerization of olefins. 3,897,364, Cl. 252-429.00C.

Colorflo Limited: *See—*
Farrow, Harold Frederick, 3,896,722.
Farrow, Harold Frederick; and Chudley, William Henry, 3,896,723.

Combustion Engineering, Inc.: *See—*
Chayes, Norman Chanine; and Kochey, Edward Leslie, Jr., 3,896,771.

Comfort, Theodore F.; Legare, Richard J.; and Rosher, Ronald, to United States of America, Navy. Propellant with polymer containing nitramine moieties as binder. 3,896,865, Cl. 149-19.400.

Commonwealth Scientific & Industrial Research Organization: *See—*
Morse, Roger Neill; Pescod, Donald; and Kowalczewski, John Joseph, 3,897,526.

Compagnie Generale des Etablissements Michelin Raison Sociale Michelin & Cie: *See—*
Massoubre, Jean Marie, 3,896,870.

Compagnie Gervais-Danone: *See—*
Carasso, Daniel, 3,896,716.

Container Corporation of America: *See—*
Vuilleumier, Ralph O., 3,896,711.

Container Graphics Corporation: *See—*
Saunders, Philip G.; and Waterbury, Neil M., 3,897,191.

Continental Can Company, Inc.: *See—*
Soja, Joseph J., 3,896,987.

Continental Industries, Inc.: *See—*
Cole, Judson C., 3,896,842.

Continental Oil Company: *See—*
Griffith, John M., 3,896,923.
Neuworth, Martin B., 3,897,500.
Sias, Roy C., 3,897,470.
Yang, Kang; Greenfield, Gaylord G.; and Henry, Joseph D., Jr., 3,897,506.

Control Data Canada, Ltd.: *See—*
Hicks, Terrence Albert, 3,897,144.

Converse, Vernon G., III; Clayton, Robert W.; and Westervelt, James T., to Scans Associates, Inc. Venturi meter. 3,896,670, Cl. 73-213.000.

Cook, Edward H., Jr., to Hooker Chemicals & Plastics Corporation. Electrolytic manufacture of chlorates, using a plurality of electrolytic cells. 3,897,320, Cl. 204-95.000.

Coplastix Limited: *See—*
McBain, Charles; and Need, Francis Richard, 3,897,043.

Corey, Garland G.: *See—*
Carmello, Robert; Salka, Barry A.; and Corey, Garland G., 3,897,357.

Cornell, Lew Wallace, to Minnesota Mining and Manufacturing Company. Tamper indicator tape. 3,896,965, Cl. 220-359.000.

Cors, John T.; and Battenberg, Virgil B. System for controlling the pitch attitude of a rocket motor boosted aircraft. 3,897,030, Cl. 244-63.000.

Cotton, Incorporated: *See—*
Swidler, Ronald; Sanderson, William A.; and Mueller, William A., 3,897,584.
Wilkes, Lambert H.; Underbrink, Gary L.; and Jones, Joseph K., 3,897,018.

Couch, Cecil; and Hix, Wayne, to Raymond Lee Organization, Inc., The, a part interest. Chalk line holder. 3,897,023, Cl. 242-100.100.

Coulter Chemistry, Inc.: *See—*
Jones, Alan Richardson, 3,897,216.

Council, Malcolm N., to Gardner-Denver Company. Mounting for drill rig mast. 3,896,887, Cl. 173-43.000.

Courtemanche, Richard D.: *See—*
Brandt, Neill M.; Courtemanche, Richard D.; and Johnson, Bruce D., 3,896,657.

Cousins, True E.: *See—*
Chaudoir, Charles J.; Cousins, True E.; and Nagy, Kornel, 3,897,160.

Couture, Gerard; and Houle, Gratien, to Wic Inc. Silo unloader. 3,896,942, Cl. 214-17.0DB.

Couture, Paul A.: *See—*
Anghinetti, Joseph R.; and Couture, Paul A., 3,896,595.

Cowan, Larry C., to Leesona Corporation. Fluid flow control elements with area dividing inserts. 3,897,041, Cl. 251-61.100.

Cramer, Kenneth R.: *See—*
Johnson, Elmer G.; and Cramer, Kenneth R., 3,896,666.

Crane Co.: *See—*
Carpenter, Richard G., 3,897,116.

Crane Packing Company: *See—*
Inka, Egons; and Shurson, Raymond O., 3,897,072.

Craven, Hull H.: *See—*
Stipp, Donald; and Craven, Hull H., 3,896,509.

Cremeans, George E.: *See—*
Scohy, John M.; Cremeans, George E.; and Luttinger, Manfred, 3,897,378.

Crewse, John L., to Cleveland Vibrator Company, The. Impactor-vibrator. 3,896,701, Cl. 91-7.000.

Crofts, John G., to Cummins Engine Company, Inc. Frangible resilient engine mounting. 3,896,739, Cl. 105-133.000.

Crossley Window Co., Inc.: *See—*
Mitchell, Henry W., 3,896,589.

Crounse, Nathan N.; Bonta, Simonn; and Ploss, Charles J., to Sterling Drug Inc. N,N-dialkyl-N-C8–C22-alkyl)-N-3-nitro-4-methoxybenzylammonium chlorides. 3,897,496, Cl. 260-567.60M.

Crouse, Ronald J.; LeBrun, Thomas Q.; Sill, Floyd E.; and Volding, Merle J., to Banctec, Incorporated. Encodable strip attachment apparatus. 3,897,299, Cl. 156-522.000.

Crowe, Talmadge L., to Baker Oil Tools, Inc. Subsurface tubing safety valve with auxiliary operating means. 3,896,876, Cl. 166-224.00A.

Cumberland Engineering Company, Inc.: *See—*
Shah, Sunil Chunilal, 3,897,016.

Cummins Engine Company, Inc.: *See—*
Crofts, John G., 3,896,739.

Cuniberti, Mario, to Owens-Illinois, Inc. Motion translating apparatus and controls therefor. 3,896,926, Cl. 198-241.000.

Curran, William Vincent: *See—*
Lindsay, Harry Lee; Angier, Robert Bruce; and Curran, William Vincent, 3,897,430.

Cuschera, Casper. Self-caulking drain. 3,896,511, Cl. 4-288.000.

Cutter, Robert C. Releasible binder. 3,897,075, Cl. 280-11.35T.

Cybersol, Inc.: *See—*
Reynolds, Beverly L., 3,897,550.

Cyphelly, Ivan Jaroslav. Hydrostatic clutch. 3,896,912, Cl. 192-61.000.

Czaja, Robert F.: *See—*
Shen, Tsung-Ying; Grenda, Victor J.; and Czaja, Robert F., 3,897,432.

Dadura, James G.: *See—*
Morduchowitz, Abraham; and Dadura, James G., 3,897,353.

Dahlstrom, Carl Lennart; and Ponton, Tord Richard William, to AB Skanska Cementgjuteriet. System for automatically aligning and/or moving in a parallel movement path a guide seating structure adapted for guiding the movement of a tool mounted thereon. 3,896,885, Cl. 173-2.000.

Dai Nippon Toryo Co., Ltd.: *See—*
Tugukuni, Hideyoshi; Kano, Masafumi; and Chikazoe, Yoshihisa, 3,897,381.

Daigle, Donald J.: *See—*
Beninate, John V.; Daigle, Donald J.; Drake, George L., Jr.; Reeves, Wilson A.; and Donaldson, Darrell J., 3,897,398.

Dainichiseika Color & Chemicals Mfg. Co. Ltd.: *See—*
Horiguchi, Shojiro; Abe, Yoshio; and Hosoda, Tohoru, 3,897,450.

Dainippon Ink & Chemicals Inc.: *See—*
Takahashi, Akikazu; Futatsugi, Yuji; Wakayama, Hiroo; and Yao, Takamu, 3,897,375.

Dale, John Robert, to U.S. Philips Corporation. Method of sealing electrical component envelopes. 3,896,542, Cl. 228-234.000.

D'Alelio, Gaetano Francis, to University of Notre Dame du Lac. Process for chain-extending unsaturated terminated polyimides and products prepared therefrom. 3,897,395, Cl. 260-63.00N.

Dalrymple, Thomas T.: *See—*
Thompson, George J.; and Dalrymple, Thomas T., 3,896,569.

Damico, Ralph A.: *See—*
Peterson, Donald J.; Ward, James F.; and Damico, Ralph A., 3,897,553.

Damoisiaux, Anthony John: *See—*
Donnelly, Robert William; Damoisiaux, Anthony John; and Evans, Raymond George, 3,897,130.

Daniello, George T. Mobile power generation device employing tropical water thermocline. 3,896,622, Cl. 60-641.000.

Daniels, James H., to Leeds & Northrup Company. Boiler-turbine control system. 3,896,623, Cl. 60-665.000.

Dart Industries Inc.: *See—*
Holoubek, George Henry; Ales, David Edward; and Harms, Harland Elmer, 3,896,710.
Wilson, Bob G., 3,897,235.

Darvishian, Arthur. Wind motor. 3,897,170, Cl. 416-119.000.

Davidson, William, Jr.; and Kauffman, Charles H., to Kauffman, Charles H. Converting municipal refuse into compost. 3,897,215, Cl. 23-259.100.

Davis, Howard G., Jr. Flying fork-type lifting member. 3,897,097, Cl. 294-67.00R.

Davis, Oliver Thurston; and Jones, Norman R. Apparatus for washing and disinfecting trailer or van interiors. 3,897,263, Cl. 134-45.000.

Davis, Robert H.; and Schick, John W., to Mobil Oil Corporation. Lubricant compositions. 3,897,351, Cl. 252-34.000.

Dawson, Boyd S., to PPG Industries, Inc. Method of handling loose glass plates. 3,896,954, Cl. 214-152.000.

Dayton-Walther Corporation: *See—*
Walther, William D.; and DeRegnaucourt, Robert A., 3,897,111.
Walther, William D.; and DeRegnaucourt, Robert A., 3,897,112.
Walther, William D.; and DeRegnaucourt, Robert A., 3,897,113.

Deason, Max W. Concrete expansion and contraction joint. 3,896,597, Cl. 52-396.000.

De Boer, Jan A., to Saval B.V. Automatic fire extinguisher for a storage tank with flammable contents. 3,896,881, Cl. 169-66.000.

DeBucs, Eugen Szabo: *See—*
Henkel, Hans-Joachim; DeBucs, Eugen Szabo; and Koch, Christian, 3,897,225.

De Cecco, Angelo L.; Hysell, Robert E.; and Piccone, Dante E., to General Electric Company. Method of aligning edges of emitter and its metalization in a semiconductor device. 3,897,286, Cl. 156-11.000.

Decker, Norman E., executor: *See—*
Willis, Henry Paul, deceased; and Decker, Norman E., executor, 3,896,893.

Deckowitz, Philip A.: *See—*
Pecoraro, Joseph K.; Deckowitz, Philip A.; and Brunner, Norman E., 3,896,871.

Deere & Company: *See—*
Frank, William Rudolph, 3,896,882.

De Francesco, Richard E.; Harris, Bernard; and Hoffman, David, to United States of America, Navy. Time base error correction for recording systems. 3,897,379, Cl. 360-27.000.

DeGeeter, Robert L.; and Schubert, George E., to Caterpillar Tractor Co. Control valve for hydraulic circuit. 3,897,115, Cl. 303-71.000.

Deguchi, Takashi: *See—*
Yamahara, Takeshi; Kishimoto, Hiroshi; Nakamura, Shinji; and Deguchi, Takashi, 3,897,507.

De Jong, Frank Cornelis, to Winkler-Den Boer, N.V. Proofing box plant. 3,896,922, Cl. 198-155.000.

DeJur-Amsco Corporation: *See—*
Ravese, Frank E., 3,897,142.

Delfosse, Gilbert; and Andiano, Jose, to Massey-Ferguson Services N.V. Grain separating apparatus. 3,897,332, Cl. 209-12.000.

Dell, Hans-Dieter: *See—*
Becker, Karl Heinz; Boltze, Karl-Heinz; Dell, Hans-Dieter; and Seidel, Peter-Rudolf, 3,897,426.
Boltze, Karl-Heinz; Brendler, Otfried; Dell, Hans-Dieter; and Jacobi, Haireddin, 3,897,482.

Del Monte, Louis A.; and Grangroth, Robert H., to Honeywell Inc. Material deposition masking for microcircuit structures. 3,897,324, Cl. 204-298.000.

Delp, Kyle I.: *See—*
Doffin, Richard L.; Delp, Kyle I.; and Delp, Vernon L., 3,896,588.

Delp, Vernon L.: *See—*
Doffin, Richard L.; Delp, Kyle I.; and Delp, Vernon L., 3,896,588.

DeRegnaucourt, Robert A.: *See—*
Walther, William D.; and DeRegnaucourt, Robert A., 3,897,111.
Walther, William D.; and DeRegnaucourt, Robert A., 3,897,112.
Walther, William D.; and DeRegnaucourt, Robert A., 3,897,113.

Design Components, Inc.: *See—*
McMurtrie, Thomas, 3,897,119.

Design Technology Corporation: *See—*
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DeSoto, Inc.: *See—*
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Detrick, Harry Rodney; and Harshbarger, Roland N., to GTE Sylvania Incorporated. Process for utilizing a photoprinting article and method for making said article. 3,897,251, Cl. 96-38.300.

Dettling, Ronald F.; and Nyberg, Donald G., to United States of America, Navy. Liquid fuel injector system. 3,897,008, Cl. 239-410.000.

Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler: *See—*
Vollheim, Gerhard; Troger, Karl-Jurgen; and Lippert, Gerhard, 3,897,499.

Devitt, John L.; Stark, Robert E.; and Gillman, Leland M., to Gates Rubber Company, The. Alkaline battery cell. 3,897,266, Cl. 136-30.000.

De Vries, Jan Roelof Jochum Hendrik, to Industriele Onderneming Wavin N.V. Plastic block bag with a valve. 3,896,708, Cl. 93-35.00R.

De Weese, Daniel P.; and Brozenick, Nicholas J., to American Air Filter Company, Inc. Fume hood. 3,897,046, Cl. 266-16.000.

Dewey, James W.; and Eaton, Alvin C., to Atkins & Merrill, Incorporated. Truck driver training apparatus. 3,896,564, Cl. 35-11.000.

Dexter, Richard J.: *See—*
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Diana, Guy D.; and Hinshaw, William B., Jr., to Sterling Drug Inc. Arylalkenyl nitriles and functional derivatives thereof. 3,897,458, Cl. 260-340.500.

Di Battista, John D., to United States of America, General Counsel-Code GP. Meteroroid impact position locator air for manned space station. 3,896,758, Cl. 116-114.0AH.

Dikmen, Ned, to Neuronics, Incorporated. Alpha brain wave sensor. 3,896,790, Cl. 128-2.10B.

Dimason, Inc.: *See—*
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Di Mura, Gerardo. Access and coupling apparatus for machine coating the interior of pipes. 3,896,761, Cl. 118-317.000.

Di Paola, Samuel J., to Goodyear Tire & Rubber Company, The. Method of forming wire woven fabric for pneumatic tires. 3,897,289, Cl. 156-88.000.

Disabato, Vincent J.: *See—*
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Doan, Troy L. Bathing facility. 3,896,508, Cl. 4-149.000.

Dobbins, John P., to Rockwell International Corporation. Display device containing a liquid-crystal cell and a suspended-crystal cell arranged in series. 3,897,137, Cl. 350-160.0LC.

Dodino, Carlo. System of self-tamping pavement formed by two reciprocally penetrated sets of blocks substantially of truncated pyramid shape. 3,897,164, Cl. 404-41.000.

Doellner, O. Leonard, to Boeing Company, The. Optically linked missile. 3,897,028, Cl. 244-3.100.

Doffin, Richard L.; Delp, Kyle I.; and Delp, Vernon L. Combined gate hinge and latch. 3,896,588, Cl. 49-394.000.

Doherty, Keith Stanley, to Petrocarbon Developments Limited. Controlling the concentration of impurities in a gas stream. 3,897,226, Cl. 55-33.000.

Dohm, Heinz; Morgenstern, Karl; Muller, Ludwig; and Wiemers, Rudolf, to Bayer Aktiengesellschaft. Oxidation of naphthalene to 1,4-naphthoquinone and phthalic anhydride. 3,897,464, Cl. 260-346.400.

Donaldson, Darrell J.: *See—*
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Donnelly, Robert William; Damoisiaux, Anthony John; and Evans, Raymond George, to ITT Industries, Inc. Flat cable connector. 3,897,130, Cl. 339-176.0MF.

Doolittle, John J. Article handling apparatus and method. 3,896,967, Cl. 221-95.000.

Dopke, James A.; and Brasile, Leland J., to Union Special Corporation. Pivotal guard for punch presses. 3,896,683, Cl. 74-612.000.

Dorr, Karl-Heinz: *See—*
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Dowbenko, Rostyslaw; and Christenson, Roger M., to PPG Industries, Inc. Ionizing radiation method for forming acrylic pressure sensitive adhesives and coated substrates. 3,897,295, Cl. 156-272.000.

Draber, Wilfried; and Regel, Erik, to Farbenfabriken Bayer AG. Process for the production of N-(1,1,1-trisubstituted)-methylazoles. 3,897,438, Cl. 260-296.00R.

Dragerwerk Aktiengesellschaft: *See—*
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Duer, Morris J., to General Motors Corporation. Non-chattering clutch for a limited slip differential mechanism. 3,896,684, Cl. 74-711.000.

Duffy, Richard J., to USM Corporation. Apparatus for making self-locking internally threaded articles. 3,896,760, Cl. 118-308.000.

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Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Ltd. Pharmacologically active compounds. 3,897,444, Cl. 260-306.80R.

Dutcher, Daniel P., to Hoerner Waldorf Corporation. Display carton for tumblers and the like. 3,896,927, Cl. 206-45.140.

Dyott, Richard Burnaby, to Post Office, The. Optical communications systems. 3,897,135, Cl. 350-96.00C.

Dzus Fastener Co. Inc.: *See—*
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E. R. Squibb & Sons, Inc.: *See—*
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Eckert, Hans-Werner; and Lehmann, Hans-Jurgen, to Henkel & Cie GmbH. Washing agents containing a textile softener and process of washing and softening textiles. 3,897,347, Cl. 252-8.750.

Economy, James; and Smith, William D., to Carborundum Company, The. α-MoC superconductor fibers. 3,897,542, Cl. 423-440.000.

Edison, Lamonte R., to General Motors Corporation. Electronic fuel injection system. 3,896,773, Cl. 123-32.0EA.

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Bridges, William B.; Edlun, William O.; and Hill, James C., 3,897,150.

Edwards, Albert, to Baker Perkins Holding Limited. Pneumatic conveyance system for particulate material. 3,896,984, Cl. 241-5.000.

Edwards, John A., to Syntex (U.S.A.) Inc. Certain thiazolecarboxamides and acylamino-thiazoles. 3,897,441, Cl. 260-302.00R.

Edwards, John A., to Syntex (U.S.A.) Inc. Thiazole cardiovascular agents. 3,897,442, Cl. 260-302.00R.

Edwards, Michael Frederick, to GKN Sankey Limited. Methods of and apparatus for production of wheels and other articles by friction or other welding. 3,896,986, Cl. 228-2.000.

Egorov, Sergei Petrovich: *See—*
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Ehlscheid, Gunter, to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei KG. Apparatus for machines for the automatic production of postal envelopes. 3,896,712, Cl. 93-61.0AC.

Eich, Edmund; and Briesofsky, Gunter, to Werkzeugmaschinenfabrik Adolf Waldrich Coburg. Device for compensating carriage weight on gantry or cantilevered machine tools. 3,896,938, Cl. 212-26.000.

Ekbladh, Fred Vage Gunnar; and Steen, Sven Lennart, to Astra-Sjuco AB. Catheter for submucous administration of local anesthetics in obtaining paracervical block. 3,896,804, Cl. 128-215.000.

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Ellis Corporation: *See—*
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Ellis, Joseph R. Method of inserting spring-loaded ball against detent. 3,896,540, Cl. 29-468.000.

Ellis, Stafford M., to Engelhard Minerals & Chemicals Corporation. Pavement grooving machine including a cutting blade guidance system. 3,896,989, Cl. 299-39.000.

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Emeny, George B. Adjustable sump pump. 3,897,176, Cl. 417-359.000.

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Emmett, John Colin: *See—*
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Erickson, Floyd B., to Monsanto Company. Photoimaging compositions comprising complex of prophyrin-SO_2 as sensitizer. 3,897,255, Cl. 96-115.00R.

Erickson, Robert Edward: *See—*
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Fagelman, Jacob. Dental instrument and clamp. 3,896,553, Cl. 32-63.000.
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Farfor, James Douglas, to Fictor Pty. Limited. Apparatus for making reinforced cement panels. 3,897,186, Cl. 425-85.000.
Farmer, William M., and Hornkohl, James O., to United States of America, Air Force. Laser doppler velocimeter. 3,897,152, Cl. 356-28.000.
Farrar, John A., Jr., to Minnesota Mining and Manufacturing Company. Connector encapsulating device and method. 3,897,129, Cl. 339-116.00C.
Farrow, Harold Frederick, to Colorflo Limited. Multi-color printing. 3,896,722, Cl. 101-115.000.
Farrow, Harold Frederick; and Chudley, William Henry, to Colorflo Limited. Apparatus for pumping fluid through a die plate to a recessed design. 3,896,723, Cl. 101-150.000.
Fauconnet, Michel, to Ateliers des Charmilles S.A. Hydraulic machine. 3,897,167, Cl. 415-95.000.
Favorite Manufacturing, Inc.: *See—*
Martin, Harlan W., 3,896,766.
Fayling, Richard E., to Minnesota Mining and Manufacturing Company. Fastening method using polymer-based magnets. 3,897,288, Cl. 156-60.000.
Fearno, John O., to Helland Research and Engineering Inc. Dynamic motor brake control for AC motors. 3,897,595, Cl. 318-212.000.
Feins, Irvin Ralph; and Yarrington, Robert Murphy, to American Cyanamid Company. Hydrotreating catalyst and process therefor. 3,897,365, Cl. 252-435.000.
Feit, Peter Werner; and Nielsen, Ole Bent Tvaermose, to Leo Pharmaceutical Products Ltd. Sulfamylbenzoic acid derivatives. 3,897,476, Cl. 260-465.00D.
Feldman, Benjamin L.; and Gaby, Frederick M. Tent. 3,896,831, Cl. 135-3.00R.
Feldstein, Morris. Securing apparatus for a dropside crib. 3,896,514, Cl. 5-100.000.
Ferraro, Jack E., to Lawrence Peska Associates, Inc., a part interest. Rollable and foldable table for automobile trunk. 3,896,742, Cl. 108-44.000.
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Klauke, Erich; Holtschmidt, Hans; and Findeisen, Kurt, 3,897,495.
Finelli, Anthony F., to Goodyear Tire & Rubber Company, The. Polyurethane cured with an aromatic monosulfide diamine. 3,897,400, Cl. 260-77.5AM.
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Finney, Kelly D. Boat trailer adjustable guide structure. 3,896,948, Cl. 214-84.000.
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Fischer, Artur. Hip joint prosthesis. 3,896,504, Cl. 3-1.912.
Fischer, Artur. Track-type toy. 3,896,735, Cl. 104-23.0FS.
Fisher, Michael H.; and Matzuk, Alexander R., to Merck & Co., Inc. Anthelmintic 1,2,4-oxadiazolines. 3,897,447, Cl. 260-307.00F.
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Flory, Donald M., to General Motors Corporation. Two-stage accumulator valve. 3,896,620, Cl. 60-547.000.
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Foller, Werner, to Gestra-KSB Vertriebsgesellschaft. Valve. 3,896,838, Cl. 137-195.000.
Follmer, Dan W. Non foaming lecithin emulsion cookware lubricant. 3,896,975, Cl. 222-192.000.
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Forte, Robert L., to Anchor Hocking Corporation. Box for containing and displaying articles of merchandise. 3,896,928, Cl. 206-45.140.
Fosnough, Robert D., to Essex International, Inc. Method of making resilient electrical contact assembly for semiconductor devices. 3,896,544, Cl. 29-588.000.
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Foster, James J.; Sittema, Richard J.; and Nelson, Russell E., to Interlake, Inc. Treatment of pickle liquor rinse water. 3,896,828, Cl. 134-57.00R.
Foster, Melvin Lewis, to Atomic Energy of Canada Limited. High strength low attenuation couch top. 3,897,345, Cl. 250-439.000.
Foster Wheeler Corporation: *See—*
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Fowler, Jackson E., to General Electric Company. Leakage control structure. 3,897,169, Cl. 415-172.00A.
Frances, Andre L.; and Brochon, Jack E. Double-sided printed circuit connection board with insertable male connector plug. 3,897,126, Cl. 339-17.0LC.
Franceschini, Augusto. Self-ballasting decoy waterfowl. 3,896,578, Cl. 43-3.000.
Frank, Arlen W.; and Drake, George L., Jr., to United States of America, Agriculture. Fireproofing cellulose textiles with tetrakis (hydroxymethyl) phosphonium chloride and aniline. 3,897,205, Cl. 8-116.00P.
Frank, William Rudolph, to Deere & Company. Implement frame. 3,896,882, Cl. 172-311.000.
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Franklin, Edna M. Drapery holder. 3,896,931, Cl. 206-326.000.
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Franz, William F.; and Hess, Howard V., to Texaco Inc. Spit flow hydrodesulfurization of petroleum fraction. 3,897,329, Cl. 208-210.000.

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Free-Flow Packaging Corporation: *See—*
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Freeman, Michael Alexander Reykers; Kempson, Geoffrey Edward; and Tuke, Michael Anthony, to National Research Development Corporation. Endosphosthetic ankle joint devices. 3,896,503, Cl. 3-1.910.

Freeman, William H., to Caterpillar Tractor Co. Tool for installing resilient rings on cylindrical members. 3,896,537, Cl. 29-235.000.

Freismuth, Richard J.; and Lopiccola, Joseph F., to Ford Motor Company. Carburetor secondary throttle shaft construction. 3,897,524, Cl. 261-23.00A.

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French, Floyd R., to Dow Chemical Company, The. Spray nozzle bottle cap. 3,897,004, Cl. 239-318.000.

Frevel, Ludo K.; and Kressley, Leonard J., to Dow Chemical Company, The. Removal of α-acetylenes from gas streams. 3,897,511, Cl. 260-681.500.

Frey, Christoph, to Ciba-Geigy Corporation. Certain isoindolinone pigments containing heavy metals. 3,897,439, Cl. 260-299.000.

Friedman, Henry, to Eli Lilly and Company. Anthelmintic phenylhydrazones. 3,897,559, Cl. 424-275.000.

Frisch, Kurt C.: *See—*
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Froberg, Magnus L., to Owens-Corning Fiberglas Corporation. Method and apparatus for cooling electrically-heated melting furnace. 3,897,234, Cl. 65-135.000.

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Fukao, Masami: *See—*
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Futaki, Kiyoshi: *See—*
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Gabry, William. Animal trap. 3,896,581, Cl. 43-81.000.

Gaby, Frederick M.: *See—*
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Garrison, Harry F.; and Kiser, Billy T. Steel barrel handling appliance. 3,897,096, Cl. 294-4.000.

Garrott, William L., to Sperry Rand Corporation. Static magnetic field metal detector. 3,896,608, Cl. 56-10.200.

Gassman, Paul G., to Ohio State University Research Foundation, The. Synthesis of oxindoles from anilines and intermediates therein. 3,897,451, Cl. 260-325.00R.

Gates Rubber Company, The: *See—*
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Goldner, Richard. Shoulder support for violin and viola. 3,896,694, Cl. 84-280.000.

Golinski, Stanley, to Western Electric Company, Inc. Method and apparatus for supporting substrates during bonding. 3,896,541, Cl. 228-180.000.

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Goodall, Charles Clifford Owen; and Amery, Edward George, to Ilford Limited. Mounting device. 3,896,719, Cl. 100-169.000.

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Gorman, DeWitt Y. Upholstery system method and apparatus. 3,896,531, Cl. 29-91.100.

Goschke, Richard, to Ciba-Geigy Corporation. Quinolineacetic acid derivatives. 3,897,436, Cl. 260-283.00S.

Gottschall, Gernot; and Doslik, Peter, to Franz Morat GmbH, Firma. Programme control devices. 3,896,638, Cl. 66-50.00R.

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Graham, Arthur; Makowski, Alexander G.; and Fuss, Gunter G., to Free-Flow Packaging Corporation. Free flow, interlocking packing material of low bulk density. 3,896,934, Cl. 206-523.000.

Granger, Maurice; and Lerond, Andre. Device for the simultaneous dispensing and severing of webs of wound material. 3,896,691, Cl. 83-335.000.

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Gray, Robert. Apparatus for making foam buildings. 3,897,298, Cl. 156-500.000.

Great Lakes Carbon Corporation: *See—*
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Green, Frank D.; and Spector, George. Tire hammer. 3,896,864, Cl. 145-36.000.

Greenbaum, Sheldon B.; Weil, Edward D.; and Newcomer, Jack S., to Hooker Chemicals & Plastics Corporation. Halogen containing tricyclic compounds. 3,897,457, Cl. 260-340.300.

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Greskovich, Charles D.; and Roth, Walter L., to General Electric Company. Polycrystalline ceramic lasers. 3,897,358, Cl. 252-301.10R.

Grieger, Cecil C.; Benefield, Roy W.; Oliver, Alton D.; and Chronister, Clyde H., to Chronister Development, Inc. Multiported valve. 3,896,855, Cl. 137-625.110.

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Groos, Horst Hans; and Richardt, Urban, to Schloemann-Siemag Aktiengesellschaft. Locking system for a rotary die carrier of an extrusion. 3,896,652, Cl. 72-263.000.

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Grout, Kenneth M. Ear plug. 3,896,801, Cl. 128-152.000.

Grover, Bruce C. Rotatable marking device for marking predetermined intervals. 3,896,725, Cl. 101-330.000.

Groves, Archie L., to PPG Industries, Inc. Controlled feeding of batch to glass making process. 3,897,232, Cl. 65-29.000.

Grozegno, Walter P.; and Trozzi, Norman K., to Foster Wheeler Corporation. Burner assembly having a tertiary air nozzle. 3,897,199, Cl. 431-184.000.

Gruber, Daniel L.; and Pollock, Earl D., to Bacfree Industries, Inc. Method and apparatus for sterilizing particulate material. 3,897,210, Cl. 21-58.000.

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Gupta, Tapan K., to Westinghouse Electric Corporation. Light transmitting polycrystalline magnesia member and method of making. 3,897,257, Cl. 106-73.200.

Gurs, Karl, to Battelle Development Corporation. Method and apparatus for making monocrystals. 3,897,590, Cl. 13-1.000.

Gutman, Arnold D., to Stauffer Chemical Company. Oximino phosphorus compounds. 3,897,516, Cl. 260-940.000.

Guy, George Victor, to Metal Box Limited. Sheet feeding apparatus and method. 3,897,053, Cl. 271-238.000.

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Haas, Georges; and Sallmann, Alfred, to Ciba-Geigy Corporation. Certain substituted anilino-phenylacetic-acid-(2,3 or 4-pyridyl)-methyl esters and derivatives. 3,897,437, Cl. 260-295.00R.

Haertig, William Milton. Corner guides. 3,897,098, Cl. 294-81.0SF.

Haglid, Frank R., to du Pont de Nemours, E. I., and Company. Thiol methylation with methyl bromide. 3,897,429, Cl. 260-248.0AS.

Haglund, Mats Torbjorn, to Luossavaara-Kiirunavaara Aktiebolag. Method of mining. 3,897,107, Cl. 299-13.000.

Hahn, Mahn Hee, to United States of America, Commerce. Controlled low-temperature cooling apparatus. 3,896,658, Cl. 73-17.00A.

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Haitmanek, Louis F., to Thomas & Betts Corporation. Means for grounding a shielded cable. 3,897,127, Cl. 339-97.00C.

Hajos, Zoltan George, to Hoffmann-La Roche Inc. 3β-Tertiarybutoxy-decahydro-benz[E]indenes. 3,897,460, Cl. 260-340.900.

Halasa, Adel Farhan; and Para, Adolph, to Firestone Tire & Rubber Company, The. Process for polymerizing conjugated dienes. 3,897,406, Cl. 260-83.700.

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Haller, Herbert C., to Albany International Corporation. Method of resurfacing a billiard table. 3,897,290, Cl. 156-98.000.

Hamamoto, Yoshito; Shirakawa, Hideo; Aida, Kazuhiko; Omura, Yutaka; Takagi, Tosiaki; Nakao, Kozo; Kawaguchi, Takuo; and Nagai, Haruo, to Kyowa Gas Chemical Industry Co. Ltd. Method of preparing diaminomaleonitrile. 3,897,477, Cl. 260-465.50R.

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Hardinge Brothers, Inc.: *See*—
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Harrington, Joseph Kenneth; and Trepka, Robert D.; to Minnesota Mining and Manufacturing Company. N-(2-benzimidazolyl)-fluoroalkanesulfonamides. 3,897,449, Cl. 260-309.200.

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Havark, Steven. Nonreleasable connecting device. 3,897,162, Cl. 403-353.000.

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Hawes, Roland C. Sample-background autocancellation in fluid-sample analyzers. 3,897,154, Cl. 356-51.000.

Hawkins, Roy E. Vehicle towing assembly. 3,897,085, Cl. 280-402.000.

Hayashi, Yukichi; Yokoda, Yutaka; Tamura, Masayuki; Kobayashi, Shinichi; Akai, Kazuyuki; and Sakai, Seiu, to Nippon Coinco Co., Ltd. Vending machine. 3,896,915, Cl. 194-1.00N.

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Hayes, Norman J. One piece animal identification tag. 3,896,577, Cl. 40-301.000.

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Heiba, El-Ahmadi Ibrahim; and Williams, Albert Lloyd, to Mobil Oil Corporation. Anti-rust compositions. 3,897,350, Cl. 252-33.400.

Heimberger, Helmut; and Griessbaum, Karl, to Opti-Holding AG. Apparatus for making monofilamentary slide-fastener members. 3,897,192, Cl. 425-391.000.

Heinzle, Otto. Slip form apparatus for constructing circular structures. 3,897,182, Cl. 425-63.000.

Heisler, Clarence J. Auxiliary tool adapter for electric hand saws having forwardly mounted auxiliary handles. 3,896,861, Cl. 144-1.00E.

Heitmann, Wilhelm: *See*—
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Helland Research and Engineering Inc.: *See*—
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Hellberg, Karl-Heinz; and Massonne, Joachim, to Kali-Chemie Aktiengesellschaft. Process for making crystalline cryolite of high bulk density. 3,897,543, Cl. 423-465.000.

Helmberger, Josef: *See*—
Meeussen, Louis Achilles; Helmberger, Josef; and Staddler, Klaus, 3,897,132.

Helmintoller, Augustus Mason, Jr.; and Beavers, Robert Gerald, to General Electric Company. Nozzle and auxiliary inlet arrangement for gas turbine engine. 3,897,001, Cl. 239-265.130.

Henderson, Glenn W.: *See*—
Millar, James S.; and Henderson, Glenn W., 3,896,843.

Henkel & Cie GmbH: *See*—
Eckert, Hans-Werner; and Lehmann, Hans-Jurgen, 3,897,347.
Stein, Werner; and Osberghaus, Rainer, 3,897,469.

Henkel, Hans-Joachim; DeBucs, Eugen Szabo; and Koch, Christian, to Siemens Aktiengesellschaft. Method and apparatus for generating a gas mixture to be formed through catalytic conversion of fuel and a gas serving as an oxygen carrier. 3,897,225, Cl. 48-107.000.

Henrick, Clive A.; and Siddall, John B., to Zoecon Corporation. Mercapto and sulfide containing dienoic thioacid esters. 3,897,473, Cl. 260-455.00R.

Henry, Joseph D., Jr.: *See*—
Yang, Kang; Greenfield, Gaylord G.; and Henry, Joseph D., Jr., 3,897,506.

Henry Manufacturing Co., Inc.: *See*—
Brandt, Robert H., 3,897,335.

Henson, Glen E.; and Fisher, Milton W., to Robar Mini-Gym, Inc. Exercise apparatus. 3,896,672, Cl. 73-379.000.

Herbert, Rolf; and Liebgott, Helmut, to Metallgesellschaft Aktiengesellschaft. Process for producing methanol. 3,897,471, Cl. 260-449.500.

Hercules Incorporated: *See*—
Allabashi, John C., 3,897,514.
Moyer, Richard Leroy, 3,896,729.
Ruckdeschel, Charles Bernard, Jr., 3,896,727.

Hergeth KG Maschinenfabrik und Apparatebau: *See*—
Beukert, Guntram, 3,896,523.

Hess, Howard V.: *See*—
Franz, William F.; and Hess, Howard V., 3,897,329.

Hess, Peter, to Metallwerk Max Brose & Co. Driver's seat with inertia-responsive locking arrangement. 3,897,101, Cl. 296-65.00A.

Hester, Jackson B., Jr., to Upjohn Company, The. 6-Phenylthiazolo[3,2-a][1,4]benzodiazepin-1-(2H)-ones, and processes. 3,897,446, Cl. 260-306.70R.

Hicks, Terrence Albert, to Control Data Canada, Ltd. Movable optical scanning for N-S movement in a map display navigational apparatus. 3,897,144, Cl. 353-11.000.

Hilbush, Edward O., Jr., to West Chester Chemical Company, Inc. Exhaust muffler. 3,896,897, Cl. 181-36.00A.

Hildebrandt, William John, to Stanley Works, The. Folding knife and replaceable blade therefor. 3,896,546, Cl. 30-157.000.

Hill, James C.: *See*—
Bridges, William B.; Edlun, William O.; and Hill, James C., 3,897,150.

Hill, Leslie: *See*—
Stephens, Michael Jeffery; and Hill, Leslie, 3,897,534.

Hiniker, Kenneth S. Floating sickle bar mower. 3,896,610, Cl. 56-15.800.

Hinshaw, William B., Jr.: *See*—
Diana, Guy D.; and Hinshaw, William B., Jr., 3,897,458.

Hiraga, Kazuo: *See*—
Hani, Hiroshi; Hiraga, Kazuo; Tsudome, Masuo; Kageyama, Hiroshi; Ito, Shunichi; and Iwai, Shinji, 3,897,533.

Hiramoto, Takeji: *See*—
Mitsui, Tsuyoshi; Hiramoto, Takeji; and Imanaka, Mitio, 3,896,925.
Hitachi, Ltd.: *See*—
Mitsui, Tsuyoshi; Hiramoto, Takeji; and Imanaka, Mitio, 3,896,925.
Hitachi Medical Corporation: *See*—
Sato, Yutaka, 3,896,788.
Hitzman, Donald O.: *See*—
Sherk, Fred T.; and Hitzman, Donald O., 3,897,303.
Hix, Wayne: *See*—
Couch, Cecil; and Hix, Wayne, 3,897,023.
Hjelle, Harold N.; and Soebbing, Jack S., to Ramsey Engineering Company. Integrated circuit handler. 3,896,935, Cl. 209-73.000.
Hoback, Ronald D.; and Geist, Joseph C., to Goodyear Tire & Rubber Company, The. Method and assembly for making a power transmission belt and belt made thereby. 3,897,291, Cl. 156-138.000.
Hock, Donal D.; Douglas, Raymond J.; and Baynes, William R., to Turco Manufacturing Company. Safety strap swing seat. 3,897,056, Cl. 272-85.000.
Hocker, Jurgen, to Bayer Aktiengesellschaft. (Thio)phosphoryl-and phosphonyl formamidines. 3,897,517, Cl. 260-941.000.
Hoechst Aktiengesellschaft: *See*—
Busch, Wolfram; Gilfrich, Hans Paul; Scholz, Albrecht; and Wallhauber, Hermann, 3,897,384.
Kindl, Erwin; and C[illegible]rick, Gunter, 3,896,764.
Schadlich, Gunther; and Moraw, Roland, 3,897,247.
Hoerbiger Ventilwerke Aktiengesellschaft: *See*—
Bauer, Friedrich; and Hrabal, Hans, 3,896,847.
Hoerner Waldorf Corporation: *See*—
Dutcher, Daniel P., 3,896,927.
Sieffert, William G., 3,896,990.
Hoffman, David: *See*—
De Francesco, Richard E.; Harris, Bernard; and Hoffman, David, 3,897,379.
Hoffmann, Hans, to Telesco Brophey Limited. Sheath for umbrella. 3,896,866, Cl. 150-52.00R.
Hoffmann-La Roche Inc.: *See*—
Hajos, Zoltan George, 3,897,460.
Saucy, Gabriel, 3,897,461.
Hofmann, Gottfried; and Kennedy, Frank, to United States Steel Corporation. Briquette molding apparatus and breaker. 3,897,183, Cl. 425-78.000.
Hofmann, Walter A.: *See*—
Christiansen, Paul; Hofmann, Walter A.; and Muller, Werner, 3,896,639.
Hogberg, Knut Bertil; Fex, Hans Jacob; Fredholm, Bo Goran; Perklev, Torsten Rune; and Veige, Sten Gunnar, to Aktiebolaget Leo. Secondary phosphoric acid esters. 3,897,519, Cl. 260-942.000.
Holmes, Lloyd H., to E-Systems, Inc. Time delay valve. 3,896,852, Cl. 137-596.180.
Holmes, Stannard D. Wire strand connecting cleat. 3,897,163, Cl. 403-406.000.
Holmstrom, William L., to Caterpillar Tractor Co. Filled piston retaining means with erosion protection. 3,896,707, Cl. 92-172.000.
Holoubek, George Henry; Ales, David Edward; and Harms, Harland Elmer, to Dart Industries Inc. Foldable tubular package apparatus. 3,896,710, Cl. 93-36.800.
Holtschmidt, Hans: *See*—
Klauke, Erich; Holtschmidt, Hans; and Findeisen, Kurt, 3,897,495.
Homler, Barry; Wasserman, Gerald S.; and Keehner, James E., to General Foods Corporation. Process for producing slush beverage concentrate and product. 3,897,571, Cl. 426-327.000.
Honeywell Inc.: *See*—
Del Monte, Louis A.; and Grangroth, Robert H., 3,897,324.
Medlar, Lewis A., 3,897,272.
Hood, Andrew Craig, to Standard Pressed Steel Co. Protective coating for ferrous metals. 3,897,222, Cl. 29-195.000.
Hood, Clarence Elam, Jr.: *See*—
McHugh, Carl Manning; Webb, Byron Kenneth; and Hood, Clarence Elam, Jr., 3,896,612.
Hooker Chemicals & Plastics Corporation: *See*—
Cook, Edward H., Jr., 3,897,320.
Greenbaum, Sheldon B.; Weil, Edward D.; and Newcomer, Jack S., 3,897,457.
Horgan, Ronald, to Barrett Bros. & Burston & Company Proprietary Limited. Malting. 3,897,569, Cl. 426-28.000.
Horiguchi, Shojiro; Abe, Yoshio; and Hosoda, Tohoru, to Dainichiseika Color & Chemicals Mfg. Co. Ltd. Metal phthalocyanine type pigment. 3,897,450, Cl. 260-314.500.
Horii, Shoichi: *See*—
Yamada, Shoji; Horii, Shoichi; Yamashita, Kiyoshi; Futaki, Kiyoshi; and Sekido, Mamoru, 3,897,254.
Hornkohl, James O.: *See*—
Farmer, William M.; and Hornkohl, James O., 3,897,152.
Horstmann, Harald; Wollweber, Hartmund; and Meng, Karl, to Bayer Aktiengesellschaft. Chlorobenzene-2,4-disulphonic acid amide carboxylic acids. 3,897,488, Cl. 260-519.000.
Hosoda, Tohoru: *See*—
Horiguchi, Shojiro; Abe, Yoshio; and Hosoda, Tohoru, 3,897,450.
Hostetler, Dewey L. Round bale loader for pickup truck. 3,896,956, Cl. 214-501.000.
Hotta, Saburo; Wada, Kiyozi; and Kikuchi, Yosiaki. Method of feeding silkworms an artificial expanded feed. 3,897,565, Cl. 426-2.000.
Houdaille Industries, Inc.: *See*—
Mandt, Mikkel G., 3,897,000.
Houle, Gratien: *See*—
Couture, Gerard; and Houle, Gratien, 3,896,942.
Howe-Baker Engineers, Inc.: *See*—
Childree, Herman T., 3,897,200.
Howes, John N., to Varlen Corporation. Cultivator tooth assembly. 3,896,883, Cl. 172-707.000.
Hrabal, Hans: *See*—
Bauer, Friedrich; and Hrabal, Hans, 3,896,847.
Huang, David H., to United States of America, Air Force. Method for manufacturing a composite wall for a regeneratively cooled thrust chamber of a liquid propellant rocket engine. 3,897,316, Cl. 204-9.000.
Hug-Inderbitzin, Marianne: *See*—
Bozzato, Giuliano; Pesaro, Mario; Schudel, Peter; Hug-Inderbitzin, Marianne; and Erickson, Robert Edward, 3,897,504.
Hughes Aircraft Company: *See*—
Bridges, William B.; Edlun, William O.; and Hill, James C., 3,897,150.
Marsh, Ogden J.; and Hunsperger, Robert G., 3,897,273.
Hultgren, Karl Sten Rudolf: *See*—
Johnsson, Stig Arthur; and Hultgren, Karl Sten Rudolf, 3,896,700.
Humbert, Daniel: *See*—
Hardy, Michael; and Humbert, Daniel, 3,897,558.
Hunsperger, Robert G.: *See*—
Marsh, Ogden J.; and Hunsperger, Robert G., 3,897,273.
Hunter, Joe S.; Little, Little J.; and Bailey, Escar L., to United States of America, Army. Earth spin axis detecting platform using coriolis acceleration detectors. 3,896,619, Cl. 33-300.000.
Hunter, Warren S. Ladder attachment. 3,896,900, Cl. 182-206.000.
Huntley, Leslie E. Air cycle heating or cooling. 3,896,632, Cl. 62-88.000.
Huper, Fritz; and Schmidt-Kastner, Gunther, to Bayer Aktiengesellschaft. Freeze concentration of aqueous solutions of heat-labile substances. 3,897,409, Cl. 260-112.500.
Huret, Jacques Andre: *See*—
Huret, Roger Henri Marius; and Huret, Jacques Andre, 3,896,679.
Huret, Roger Henri Marius; and Huret, Jacques Andre. Bicycle derailer. 3,896,679, Cl. 74-217.00B.
Hursen, Thomas F.; and Kolenik, Steve Andrew, to Arco Nuclear Company. Implantable nerve stimulator. 3,896,817, Cl. 128-419.00R.
Hurst, Thomas L., to A. E. Staley Manufacturing Company. Process for producing dextrose. 3,897,305, Cl. 195-31.00R.
Hutley, Ronald W. F., to Sperry Rand Corporation. Double band type carrier. 3,896,919, Cl. 197-49.000.
Huygelen, Constant: *See*—
Zygraich, Nathan; and Huygelen, Constant, 3,897,549.
Hydril Company: *See*—
Le Rouax, Robert K., 3,897,038.
Le Rouax, Robert K., 3,897,039.
Le Rouax, Robert K., 3,897,040.
Le Rouax, Robert K., 3,897,071.
Hydroacoustics, Inc.: *See*—
Bouyoucos, John V., 3,896,889.
Hymes, Richard H. Dry particulate blend containing binder/dispersion aid component comprising cellulosic and vinyl acetate and/or alcohol materials and method of using the blend in a roll-on texture composition. 3,897,577, Cl. 427-277.000.
Hysell, Robert E.: *See*—
De Cecco, Angelo L.; Hysell, Robert E.; and Piccone, Dante E., 3,897,286.
Iannone, Gary L. Device for testing the tune of musical instruments. 3,896,697, Cl. 84-454.000.
Iannucci, Vincent A., to Rockwell International Corporation. Assembly for preforming wire during helical winding. 3,896,860, Cl. 140-149.000.
Ibaragi, Tetsuo; Yamamoto, Keishi; and Noda, Yasuhiko, to Sumikin Coke Company Limited. Duct connecting device. 3,897,313, Cl. 202-263.000.
Ichihara, Shoichi: *See*—
Ohara, Takashi; Ichihara, Shoichi; Saito, Koichi; and Ono, Tetsuji, 3,897,368.
ICI United States Inc.: *See*—
Lu, Robert T., 3,897,393.
Shay, Barry M., 3,897,208.
ICN Pharmaceuticals, Inc.: *See*—
Robins, Roland K.; and Witkowski, Joseph T., 3,897,415.
Shuman, Dennis A.; Meyer, Rich B., Jr.; and Robins, Roland K., 3,897,413.
Idoffsson, Sten Esse Torgild. Apparatus for transferring waste material from refuse collecting trucks to a transport vehicle. 3,896,944, Cl. 214-41.000.
Ilford Limited: *See*—
Goodall, Charles Clifford Owen; and Amery, Edward George, 3,896,719.
Illinois Tool Works Inc.: *See*—
Pomernacki, Henry, 3,896,539.
Reinwall, Ernest William, Jr., 3,897,161.
Imanaka, Mitio: *See*—
Mitsui, Tsuyoshi; Hiramoto, Takeji; and Imanaka, Mitio, 3,896,925.
Imperial Chemical Industries Limited: *See*—
Moilliet, John Lewis; and Ryan, James Ernest, 3,897,371.
Neilson, David, 3,897,087.
Punja, Nazim, 3,897,557.

Inamoto, Yoshiaki; Kadono, Takeji; and Takaishi, Naotake, to Kao Soap Co., Ltd. Process for the halogenation of adamantanes. 3,897,479, Cl. 260-468.00G.

Indiana University Foundation: *See*—
Katz, Simon, 3,897,548.

Industriele Onderneming Wavin N.V.: *See*—
De Vries, Jan Roelof Jochum Hendrik, 3,896,708.

Ingemansson, Nils Stig Percy; and Larsen, Jorgen Rasmus. Multiple-pane building-panel. 3,897,580, Cl. 428-34.000.

Ingersoll-Rand Company: *See*—
Luthi, Oscar, 3,897,014.

Inka, Egons; and Shurson, Raymond O., to Crane Packing Company. Slit ring with connecting membrane. 3,897,072, Cl. 277-215.000.

Inklaar, Petrus Adam, to Vasco Industries Corporation. Non-adherent wrapping of shaped protein food products. 3,897,567, Cl. 426-8.000.

Inland Steel Company: *See*—
Taylor, Harold L.; and Marshall, John M., 3,897,230.

Insalaco, Charles J. Nursery pot having improved drainage. 3,896,587, Cl. 47-34.000.

Institut Dr. Friedrich Forster: *See*—
Lange, Hans M., 3,896,646.

Institut Francais du Petrole, des Carburants et Lubrifiants: *See*—
Tkatchenko, Igor, 3,897,508.

Institute of Gas Technology: *See*—
Fleming, Donald K., 3,897,539.

Institute po Biochimia pri Ban: *See*—
Alexiev, Boris Vasilev; Stoev, Stoycho Borisov; Spasov, Alexander Vasilev; Maneva, Lilyana Stoilova; Emanuilov, Emanuil Alexandrov; and Golovinski, Evgeni Victorov, 3,897,494.

Interlake, Inc.: *See*—
Armour, Frank K.; and Touzalin, Robert E., 3,897,312.
Foster, James J.; Sittema, Richard J.; and Nelson, Russell E., 3,896,828.

International Business Machines Corporation: *See*—
Ritchie, Robert T.; and Rogers, James C., 3,897,148.

International Minerals & Chemical Corporation: *See*—
White, Edward A., 3,897,575.

International Paper Company: *See*—
Royal, Thomas B., 3,896,607.

International Standard Electric Corporation: *See*—
Ruzic, Hugo; Scholpp, Robert; and Vomel, Paul Gerhard, 3,896,916.

International Telephone and Telegraph Corporation: *See*—
Werstein, Frank A.; and Barnes, William R., 3,896,599.

Interpace Corporation: *See*—
Swanson, Harold V.; and Bald, Robert E., 3,897,073.

Interx Research Corporation: *See*—
Bodor, Nicolae S.; and Kaminski, James J., 3,897,425.

Isard, Arsene: *See*—
Parvi, Ludovic; and Isard, Arsene, 3,897,472.

Iseda, Yutaka: *See*—
Ishii, Michio; Watabe, Yoji; and Iseda, Yutaka, 3,897,396.

Ishigaki, Masahiro: *See*—
Fujishima, Hiroyasu; Aoe, Kensei; and Ishigaki, Masahiro, 3,896,869.

Ishii, Michio; Watabe, Yoji; and Iseda, Yutaka, to Bridgestone Tire Company Limited. With substituted benzoic acid catalysts accelerating the cure of polyurethaneureas. 3,897,396, Cl. 260-75.0NB.

Ishii, Shigetaka: *See*—
Yokotsuka, Tamotsu; Aoyama, Yasuo; Kikuchi, Tadaaki; Ishii, Shigetaka; and Matsuura, Masaru, 3,897,570.

Ishizawa, Noboru: *See*—
Takahashi, Masaaki; Ishizawa, Noboru; and Nishida, Masazo, 3,897,374.

Isom, William C. Electric light cart. 3,897,080, Cl. 280-47.190.

Ito, Shunichi: *See*—
Hani, Hiroshi; Hiraga, Kazuo; Tsudome, Masuo; Kageyama, Hiroshi; Ito, Shunichi; and Iwai, Shinji, 3,897,533.

ITT Industries, Inc.: *See*—
Donnelly, Robert William; Damoisiaux, Anthony John; and Evans, Raymond George, 3,897,130.

Iwai, Shinji: *See*—
Hani, Hiroshi; Hiraga, Kazuo; Tsudome, Masuo; Kageyama, Hiroshi; Ito, Shunichi; and Iwai, Shinji, 3,897,533.

Iwanaga, Ken: *See*—
Sakai, Kazuo; Iwanaga, Ken; Machara, Kazuo; Nakajima, Tsuyoshi; Yotsuya, Koki; Ookuma, Humio; Baba, Takeo; and Yamanaka, Toshitaka, 3,896,653.

J. Bobst & Fils S.A.: *See*—
Weinguni, Othmar, 3,896,983.

J. I. Case Company: *See*—
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Seaberg, David H.; and Purdy, Paul J., 3,896,951.

J. N. Tuttle, Inc.: *See*—
Tuttle, Bertha S.; and Ozolins, Jekabs, 3,897,278.

Jabalpurwala, Kaizer Esufali; and Malinowski, Henryk, to Zochem Limited. Production of photoconductive zinc oxide. 3,897,248, Cl. 96-1.800.

Jacobi, Haireddin: *See*—
Boltze, Karl-Heinz; Brendler, Otfried; Dell, Hans-Dieter; and Jacobi, Haireddin, 3,897,482.

Jacques, Albert M. V., to Amchem Products, Inc. Purification of aliphatic phosphonic acids. 3,897,486, Cl. 260-502.40R.

Jaquiss, Donald B. G.; and Munro, Howard E., to General Electric Company. Process for preparing polycarbonate. 3,897,391, Cl. 260-47.0XA.

Jefferson Chemical Company, Inc.: *See*—
Gipson, Robert Malone; Yeakey, Ernest Leon; and Pepel, William Jennings, 3,897,383.
Watts, Lewis William, Jr., 3,897,475.

Jefferson, Robert T.: *See*—
Salyer, Ival O.; and Jefferson, Robert T., 3,897,221.

Jeffress, Ronald E., to General Electric Company. Flash/flooded boiler steam iron. 3,896,572, Cl. 38-77.830.

Jennings, Ralph Earnest. Football blocking apparatus. 3,897,060, Cl. 273-55.00R.

Jensen, Niels. Audio-visual teaching machine. 3,896,563, Cl. 35-9.00A.

Jervis B. Webb Company: *See*—
Kohls, James P.; Borgman, Robert J.; and Campbell, Frederic W., 3,896,892.

Jeter, John D., to Texas Dynamatics, Inc. Method and apparatus for actuating downhole devices. 3,896,667, Cl. 73-151.000.

Jirmanus, Naila Saba; Rindone, Guy E.; and Bouchard, Andre C., to GTE Sylvania Incorporated. New transparent low thermal conductivity glass compositions and lamp envelopes made therefrom. 3,897,197, Cl. 431-95.000.

Johansson, Tage Hjalmar, to Kockum Industri Aktiebolag. Gang saw with improved damping means. 3,896,693, Cl. 83-748.000.

Johnson, Bruce D.: *See*—
Brandt, Neill M.; Courtemanche, Richard D.; and Johnson, Bruce D., 3,896,657.

Johnson, Elmer G.; and Cramer, Kenneth R. Induced agglomeration system for use in a system for simulating reentry flow conditions. 3,896,666, Cl. 73-147.000.

Johnson, Gary L.; and Maki, Michael W., to Dimason, Inc. Paperback book holder. 3,897,037, Cl. 248-460.000.

Johnson, John A., to Kansas State University Research Foundation. Process and compositions for manufacture of yeast-raised products without fermentation. 3,897,568, Cl. 426-23.000.

Johnson & Johnson: *See*—
Babcock, Donald, 3,897,293.

Johnson, Lowell E.: *See*—
Audiffred, Sidney J.; Bump, David W.; Erkkila, Raymond N.; Johnson, Lowell E.; and Pearce, Shairyl I., 3,896,910.

Johnsson, Stig Arthur; and Hultgren, Karl Sten Rudolf, to AB Bofors. Driving and steering system for a motor vehicle. 3,896,700, Cl. 89-40.00C.

Joiner, Thomas R., to Plan Hold Corporation. Friction binder having variable clamping forces. 3,896,526, Cl. 24-67.100.

Jolly, Jean: *See*—
Warnant, Julien; and Jolly, Jean, 3,897,417.

Jones, Alan Richardson, to Coulter Chemistry, Inc. Sample cup holder. 3,897,216, Cl. 23-259.000.

Jones, Howard, to Merck & Co., Inc. Preparation of 5-fluoro-2-methyl-1-(p-methylsulfinylbenzylidene) indenyl-3-acetic acid. 3,897,487, Cl. 260-515.00A.

Jones, James B.: *See*—
Brauns, Frank; and Jones, James B., 3,896,749.

Jones, Joseph K.: *See*—
Wilkes, Lambert H.; Underbrink, Gary L.; and Jones, Joseph K., 3,897,018.

Jones, Norman R.: *See*—
Davis, Oliver Thurston; and Jones, Norman R., 3,897,263.

Jones, Thomas Ivor: *See*—
Harris, Arthur; Burrows, John; and Jones, Thomas Ivor, 3,897,209.

Kachergis, Henry J. Ball cock valve. 3,897,042, Cl. 251-77.000.

Kadono, Takeji: *See*—
Inamoto, Yoshiaki; Kadono, Takeji; and Takaishi, Naotake, 3,897,479.

Kageyama, Hiroo: *See*—
Asai, Soichiro; Tazuke, Hideo; and Kageyama, Hiroo, 3,897,484.

Kageyama, Hiroshi: *See*—
Hani, Hiroshi; Hiraga, Kazuo; Tsudome, Masuo; Kageyama, Hiroshi; Ito, Shunichi; and Iwai, Shinji, 3,897,533.

Kalart Victor Corporation: *See*—
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Kali-Chemie Aktiengesellschaft: *See*—
Hellberg, Karl-Heinz; and Massonne, Joachim, 3,897,543.

Kaminski, James J.: *See*—
Bodor, Nicolae S.; and Kaminski, James J., 3,897,425.

Kanda, Masao; and Saeiki, Keiso, to Fuji Photo Film Co., Ltd. Process of producing capsule-coated sheets. 3,897,578, Cl. 427-358.000.

Kanegafuchi Chemical Industries Co., Ltd.: *See*—
Sassa, Nagamasa; Suzuki, Tarou; Kohchi, Yoshihiro; and Kubota, Shigeyuki, 3,897,304.

Kanehira, Katsuyuki: *See*—
Mitsui, Kazuhiko; and Kanehira, Katsuyuki, 3,896,793.

Kango Electric Hammers Limited: *See*—
Badcock, David Norman William, 3,896,888.

Kano, Ichiro, to Canon Kabushiki Kaisha. Projection lens for mask pattern printing. 3,897,138, Cl. 350-183.000.

Kano, Masafumi: *See*—
Tugukuni, Hideyoshi; Kano, Masafumi; and Chikazoe, Yoshihisa, 3,897,381.

Kansas State University Research Foundation: *See*—
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Kao Soap Co., Ltd.: *See*—
Inamoto, Yoshiaki; Kadono, Takeji; and Takaishi, Naotake, 3,897,479.

Karhu-Titan oy: *See*—
Tiitola, Antti-Jussi, 3,897,074.

Kaspar, Milos: *See—*
Beranek, Jaroslav; Kaspar, Milos; Bazant, Vladimir; and Chladek, Antonin, 3,897,546.

Kaszei, Jeno: *See—*
Binzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Kaszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 3,897,190.

Kataoka, Mitsuru: *See—*
Morisawa, Yasuhiro; Kataoka, Mitsuru; Watanabe, Taiichiro; Kitano, Noritoshi; and Matsuzawa, Toshiaki, 3,897,556.

Katner, Allen S., to Eli Lilly and Company. Pyrazolo[1,5-c]quinazolin-5(6H)-ones. 3,897,434, Cl. 260-256.40Q.

Kattan, Abraham; and Gwyn, John E., to Shell Oil Company. Vapor recovery and disposal system. 3,897,193, Cl. 431-5.000.

Katz, Simon, to Indiana University Foundation. Oral compositions for retarding the formation of dental plaque and methods of utilization thereof. 3,897,548, Cl. 424-54.000.

Katzer, Ernst, to Knorr-Bremse GmbH. Centering device for a rail brake magnet. 3,897,117, Cl. 308-3.00R.

Kauffman, Charles H : *See—*
Davidson, William, Jr.; and Kauffman, Charles H., 3,897,215.

Kaufman, Harry; and Gordin, Myron K., to O.K. Machine and Tool Corporation. Electrical wire inserting tool. 3,896,534, Cl. 29-203.0HC.

Kawaguchi, Takuo: *See—*
Hamamoto, Yoshito; Shirakawa, Hideo; Aida, Kazuhiko; Omura, Yutaka; Takagi, Tosiaki; Nakao, Kozo; Kawaguchi, Takuo; and Nagai, Haruo, 3,897,477.

Kawahara, Nobuyoshi: *See—*
Nakatsuka, Ryuzo; Furuta, Mituo; Suzuki, Setsuo; and Kawahara, Nobuyoshi, 3,897,581.

Kawakami, Hideo, to Takagi Tekko Kabushiki Kaisha. Locking device for a motorcycle driver's helmet. 3,896,643, Cl. 70-59.000.

Kawakami, James Hajime: *See—*
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Kawanc, Tsuyoshi: *See—*
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Kearney, John A., to Bibb Company, The. Method of preparing cellulosic textile materials having improved soil release and stain resistance properties. 3,897,206, Cl. 8-120.000.

Keehner, James E.: *See—*
Homler, Barry; Wasserman, Gerald S.; and Keehner, James E., 3,897,571.

Keenan, Charles A.; and Cederstrand, Carl N., to Beckman Instruments, Inc. Phase and amplitude balance adjustment for a dual beam infrared gas analyzer. 3,897,153, Cl. 356-51.000.

Kehr, Clifton Leroy; Murch, Robert M.; and Marans, Nelson Samuel, to W. R. Grace & Co. Smoke-flame retardant hydrophilic urethane and method. 3,897,372, Cl. 260-2.5AJ.

Keith, Carl D.; and Mooney, John J., to Engelhard Minerals & Chemicals Corporation. Process and apparatus. 3,896,616, Cl. 60-274.000.

Keller, Harold A.; and Saunders, Robert J., to Potlatch Corporation. Orienter for wood strands. 3,896,536, Cl. 29-211.00R.

Kellett, Richard Edward, to Antler Limited. Travel cases. 3,896,909, Cl. 190-53.000.

Kelly, Charles E. Safety belt for snowmobile and motorcycle passengers. 3,896,499, Cl. 2-311.000.

Kelly, Kirsteen Ormiston, to Lever Brothers Company. Fish product. 3,897,573, Cl. 426-272.000.

Kelsey-Hayes Company: *See—*
Scharlack, Ronald S., 3,897,114.

Kempson, Geoffrey Edward: *See—*
Freeman, Michael Alexander Reykers; Kempson, Geoffrey Edward; and Tuke, Michael Anthony, 3,896,503.

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Kendall, Don L.: *See—*
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Khimenko, Lev Timofeevich: *See—*
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Khouzam, George: *See—*
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Kieslich, Klaus: *See—*
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Kiguchi, Yukiaki: *See—*
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Yokotsuka, Tamotsu; Aoyama, Yasuo; Kikuchi, Tadaaki; Ishii, Shigetaka; and Matsuura, Masaru, 3,897,570.

Kikuchi, Tadaaki: *See—*
Yokotsuka, Tamotsu; Aoyama, Yasuo; Kikuchi, Tadaaki; Ishii, Shigetaka; and Matsuura, Masaru, 3,897,570.

Kikuchi, Yosiaki: *See—*
Hotta, Saburo; Wada, Kiyozi; and Kikuchi, Yosiaki, 3,897,565.

Kilmer, Earl E., to United States of America, Navy. Explosive initiator device. 3,896,731, Cl. 102-22.000.

Kim, Chang-Kyo, to Westinghouse Electric Corporation. Self-contained static power system. 3,897,271, Cl. 136-202.000.

Kimi, Atutane: *See—*
Yaginuma, Hiroshi; Suzuki, Takashi; and Kimi, Atutane, 3,897,260.

Kindl, Erwin; and Gerick, Gunter, to Hoechst Aktiengesellschaft. Extrusion apparatus for coating both surfaces of tubular material. 3,896,764, Cl. 118-408.000.

King, Walter John: *See—*
Tseung, Alfred Chan Chung; Wan, Beatrice Yuck Chaan; and King, Walter John, 3,897,267.

Kingsbury, Lyle Heath. Bridge for musical instrument. 3,896,695, Cl. 84-307.000.

Kirby, Robert Andrew; and Bayhi, Joseph Frank, to Exxon Production Research Company. High frequency seismic source using compressed air. 3,896,898, Cl. 181-120.000.

Kirin, Evgeny Mikhailovich: *See—*
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Kishimoto, Hiroshi: *See—*
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Kishino, Shigeo; Yamada, Yasuo; Kurahashi, Yoshio; and Kume, Toyohiko, to Bayer Aktiengesellschaft. Fungicidal and bactericidal O-alkyl-O-cyclohexyl-S-alkyl-, haloalkyl-or alkenyl-phosphorothiolates. 3,897,552, Cl. 424-219.000.

Kitano, Noritoshi: *See—*
Morisawa, Yasuhiro; Kataoka, Mitsuru; Watanabe, Taiichiro; Kitano, Noritoshi; and Matsuzawa, Toshiaki, 3,897,556.

Kitasato Institute, The: *See—*
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Kiwalle, Jozef, to Production Technology Inc. Indexing apparatus for rotary machine tool. 3,896,985, Cl. 228-2.000.

Kiyota, Takashi, to Nippon Oil Co., Ltd. Process for the production of 5-alkylidenenorbornene-2. 3,897,510, Cl. 260-666.0PY.

Klauke, Erich; Holtschmidt, Hans; and Findeisen, Kurt, to Bayer Aktiengesellschaft. Perhalogen-2-azapropenes process. 3,897,495, Cl. 260-566.00D.

Klein, Erich, to Dragoco Spezialfabrik Konzentrierte Riech-und Aromastoffe Gerberding & Co. GmbH. Aroma compositions containing cycloaliphatic crotonyl compounds. 3,897,370, Cl. 252-522.000.

Klein, Georg; Rossler, Kurt; Brockschmidt, Karl; and Rettweiler, Horst. Machine for crushing and cutting large objects. 3,897,019, Cl. 241-257.00R.

Klein, Joseph R., to United States of America, Air Force. Meltable plug radiation switch. 3,897,302, Cl. 176-86.00M.

Klockner-Werke AG: *See—*
Krohm, Reinhold; and Bahre, Karl, 3,897,108.
Langhammer, Hans-Juergen, 3,897,243.

Knecht, Fritz, to Techmed AG, Firma. Cutter knife for the preparation of meat. 3,897,020, Cl. 241-292.100.

Knepper, William A., to United States Steel Corporation. Two-stage fluidized bed reactor with nozzle tuyeres. 3,896,560, Cl. 34-57.00R.

Knock-N-Lok International, Inc.: *See—*
Solo, Alan J., 3,897,035.

Knorr-Bremse GmbH: *See—*
Katzer, Ernst, 3,897,117.

Knutsen, Roald Willies, to Saxlund A/S. Apparatus for unloading material such as chips or the like from the bottom of a silo. 3,896,943, Cl. 214-17.0DA.

Kobayashi, Shinichi: *See—*
Hayashi, Yukichi; Yokoda, Yutaka; Tamura, Masayuki; Kobayashi, Shinichi; Akai, Kazuyuki; and Sakai, Seiu, 3,896,915.

Kobayashi, Yoshickika; Masuda, Mutsuo; and Takagawa, Masanori, to Matsushita Electronics Corporation. Europium activated alkaline earth metal alumino silicate phosphor and method for preparing the same. 3,897,359, Cl. 252-301.40F.

Koch, Alvin F. Athletic testing device. 3,897,058, Cl. 273-26.00B.

Koch, Christian: *See—*
Henkel, Hans-Joachim; DeBucs, Eugen Szabo; and Koch, Christian, 3,897,225.

Kochey, Edward Leslie, Jr.: *See—*
Chayes, Norman Chanine; and Kochey, Edward Leslie, Jr., 3,896,771.

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Koehring GmbH: *See—*
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Kohchi, Yoshihiro: *See—*
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Kohls, James P.; Borgman, Robert J.; and Campbell, Frederic W., to Jervis B. Webb Company. Manual control for a self-propelled vehicle. 3,896,892, Cl. 180-19.00H.

Kohn, Gustave K.; Brown, Melancthon S., deceased; and by Kohn, Gustave K., special administrator. Insecticidal N-thio-substituted carbamates of dihydrobenzofuranols. 3,897,463, Cl. 260-346.20R.

Kohn, Gustave K., special administrator: *See*—
Brown, Melancthon S., deceased; and Kohn, Gustave K., special administrator, 3,897,561.
Kohn, Gustave K.; Brown, Melancthon S., deceased; and Kohn, Gustave K., special administrator, 3,897,463.

Kohne, Harry F., Jr.; and Kurrle, Frederick L., to Westvaco Corporation. Paper filled with a blushed particulate polystyrene pigment. 3,897,300, Cl. 162-169.000.

Kokusan Denki Co., Ltd.: *See*—
Kondo, Tetsuya, 3,896,780.

Kolb, William A., to United States Steel Corporation. Sensor probe control system. 3,896,674, Cl. 73-432.00R.

Kolb, William A.; and Sigh, Jack F., to United States Steel Corporation. Apparatus for and method of refining an iron base melt. 3,897,047, Cl. 266-35.000.

Kolenik, Steve Andrew: *See*—
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Kollmann, George J.: *See*—
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Kominami, Hiroshi: *See*—
Yokota, Tsuyoshi; Asai, Koetsu; Harada, Hisamitsu; and Kominami, Hiroshi, 3,896,952.

Kondo, Motoki, to Nippon Electric Company, Limited. Method of implanting ions of different mass numbers in semiconductor crystals. 3,897,276, Cl. 148-1.500.

Kondo, Tetsuya, to Kokusan Denki Co., Ltd. Breakerless ignition system for a multicylinder internal combustion engine. 3,896,780, Cl. 123-148.00E.

Konsbruck, Robert H.; and Scott, Robert T., to General Motors Corporation. Vehicle drive with clutch engagement control. 3,896,914, Cl. 192-.098.

Koppel, Gary A.; and Lunn, William H. W., to Eli Lilly and Company. Process for 7-β-amino-7-α-methoxy-cephalosporanic acid esters and related compounds. 3,897,424, Cl. 260-243.00C.

Koppel, Gary A., to Eli Lilly and Company. α-(Dibenzylphosphono)acetic acids. 3,897,518, Cl. 260-941.000.

Koppers Company Inc.: *See*—
Garrett, Clyde Barner; and Thayer, William Stansbury, 3,896,730.
Krenke, Vincent G., 3,897,311.
Tucker, Linwood G., 3,897,310.

Korte, Siegfried; Suling, Carlhans; and Lorenz, Gunter, to Bayer Aktiengesellschaft. Process for the production of copolymers containing acrylic acid amides. 3,897,404, Cl. 260-79.5NV.

Kostenowczyk, Stanley, to Singer Company, The. Low friction means for sewing machine work clamp. 3,896,748, Cl. 112-70.000.

Kowalczewski, John Joseph: *See*—
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Kozlowski, Edward C.; and Chamlin, Matthew D. Composite flexible, semi-rigid materials and process for making same. 3,896,991, Cl. 229-55.000.

Kraina, Jack H., to Caterpillar Tractor Co. Steering system with electrically driven secondary steering means. 3,896,617, Cl. 60-403.000.

Krapcho, John; and Turk, Chester F., to E. R. Squibb & Sons, Inc. 2-Aminoalkyl-7-substituted-3,3a,4,5,6,7-hexahydro-3-substituted-2H-pyrazolo(4,3-c)pyridines. 3,897,420, Cl. 260-240.00F.

Kreidler, Alfred, to Metall-Invent S.A. Measuring/indicating instrument. 3,896,682, Cl. 74-606.00R.

Kreissig, Ernst Florian, to Schweizerische Lokomotiv-und Maschinenfabrik. Pneumatic bogie stabilizer. 3,896,740, Cl. 105-164.000.

Krenke, Vincent G., to Koppers Company Inc. Pusher ram and quench car travel synchronization system. 3,897,311, Cl. 202-262.000.

Kress, Rudolf: *See*—
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Kressley, Leonard J.: *See*—
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Kricsfalussy, Zoltan; Blocher, Karlheinz; Pawlowski, Juri; Scherhag, Bernhard; and Weiler, Raoul, to Bayer Aktiengesellschaft. Process for preparing pure cyanogen chloride. 3,897,541, Cl. 423-379.000.

Krohm, Reinhold; and Bahre, Karl, to Klockner-Werke AG. Long-wall mining apparatus. 3,897,108, Cl. 299-34.000.

Krueger, John A.: *See*—
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Kubasa, Alois: *See*—
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Kubick, Mark: *See*—
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Kubota, Shigeyuki: *See*—
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Kucera, Josef: *See*—
Stoy, Vladimir; Stoy, Artur; Urbanova, Renata; Prokop, Jaroslav; and Kucera, Josef, 3,897,382.

Kucher, Robert C., to Rendell Tractor & Equipment Co., Ltd. Rotatable downwardly directed driveline. 3,896,757, Cl. 115-35.000.

Kugler Fonderie et Robinetterie S.A.: *See*—
Labarre, Claude, 3,896,836.

Kuhlthau, Hans-Peter, to Bayer Aktiengesellschaft. Basic dyestuffs. 3,897,418, Cl. 260-240.00G.

Kuhn, Jorg; and Sohm, Elmar. Multistory building with a material handling elevator apparatus having fixed and movable tracks. 3,896,941, Cl. 214-16.40A.

Kukolja, Stjepan, to Eli Lilly and Company. 5-EPI-penicillins. 3,897,445, Cl. 260-306.70C.

Kulsa, Peter; and Waksmunski, Frank S., to Merck & Co., Inc. Anticoccidial composition. 3,897,563, Cl. 424-326.000.

Kulwiec, Leonard, to Sterndent Corporation. Prosthetic article and method for manufacture. 3,896,547, Cl. 32-10.00A.

Kume, Toyohiko: *See*—
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Kunz, Gustav: *See*—
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Kuo, Chan-Hwa; Taub, David; and Wendler, Norman L., to Merck & Co., Inc. 5-Oxo-1β-cyclopentane heptanoic acid derivative. 3,897,459, Cl. 260-340.900.

Kurahashi, Yoshio: *See*—
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Kuraray Co., Ltd.: *See*—
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Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
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Kurrle, Frederick L.: *See*—
Kohne, Harry F., Jr.; and Kurrle, Frederick L., 3,897,300.

Kurtz, Leonard D., to Sutures, Inc. Sutures having long-lasting biocidal properties. 3,896,812, Cl. 128-335.500.

Kurtz, Leonard D., to Sutures, Inc. Sutures having long-lasting biocidal properties. 3,896,813, Cl. 128-335.500.

Kyowa Gas Chemical Industry Co. Ltd.: *See*—
Hamamoto, Yoshito; Shirakawa, Hideo; Aida, Kazuhiko; Omura, Yutaka; Takagi, Tosiaki; Nakao, Kozo; Kawaguchi, Takuo; and Nagai, Haruo, 3,897,477.

Laauwe, Robert H. Aerosol package of product containing liquified gas. 3,896,970, Cl. 222-94.000.

Labarre, Claude, to Kugler Fonderie et Robinetterie S.A. Hot and cold water mixing device. 3,896,836, Cl. 137-98.000.

Laboratoires J. Berthier: *See*—
Meunier, Henry Eugene Jean-Marie, 3,897,485.

Lada, George J., to Allied Chemical Corporation. Dual action laminar air flow. 3,897,229, Cl. 55-467.000.

Lagos, Costas C., to GTE Sylvania Incorporated. Manganese and cerium activated barium calcium orthophosphate phosphor. 3,897,360, Cl. 252-301.40P.

Lagsdin, Andry: *See*—
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Laitram Corporation, The: *See*—
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Lampe, Warren R., to General Electric Company. Room temperature vulcanizable silicone rubber composition. 3,897,376, Cl. 260-18.00S.

Landstingens Inkopscentral: *See*—
Von Post, Jan Ake; and Petersson, Gosta Erik Mauritz, 3,896,518.

Lange, Hans; Rittersdorf, Walter; and Rey, Hans-Georg, to Boehringer Mannheim GmbH. Diagnostic device. 3,897,214, Cl. 23-253.0TP.

Lange, Hans M., to Institut Dr. Friedrich Forster; and Th. Kieserling & Albrecht. Testing probe for non-destructive testing of material. 3,896,646, Cl. 72-14.000.

Langhammer, Hans-Juergen, to Klockner-Werke AG. Smelting process and furnace. 3,897,243, Cl. 75-10.00V.

Lanier Electronic Laboratory, Inc.: *See*—
Bolick, Fred C., Jr., 3,897,027.

Lannert, Kent P., to Monsanto Company. Hydroxy ether carboxylates. 3,897,490, Cl. 260-535.00P.

Lapac, Edward F.; Miazga, Joseph F.; and Mittleman, Irving M., to United Aircraft Corporation. Process for fixturing a workpiece by quenching a liquid resin. 3,897,535, Cl. 264-268.000.

Lapeyre, James M., to Laitram Corporation, The. Apparatus for removing meat from animal bone. 3,896,522, Cl. 17-46.000.

Laporte Industries Limited: *See*—
Newton, Geoffrey Phillip, 3,897,399.
Robinson, Michael; Clamp, Frank; Aberdeen, David; and Mobbs, David Barry, 3,897,537.

Larsen, Jorgen Rasmus: *See*—
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Larson, Roger L., to Raygo, Inc. Dual amplitude vibration generator. 3,896,677, Cl. 74-61.000.

Lau, Gunther; Bradatsch, Edmund; Brandl, Hermann J.; and Niggel, Georg. Impregnating corrugated cardboard. 3,896,763, Cl. 118-50.000.

Lauder, Alan, to du Pont de Nemours, E. I., and Company. Metal oxide catalytic compositions. 3,897,367, Cl. 252-462.000.

Lawrence Peska Associates, Inc.: *See*—
Cohen, Richard J., 3,896,582.
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Lay, Robert E., Jr.: *See*—
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Leach, Burleigh H.: *See*—
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Leathers, Joel M., to Dow Chemical Company, The. Method for gusseting continuous lengths of tubular material. 3,897,530, Cl. 264-89.000.
Leblanc, Conrad; and Marchi, Vitalino, to Foster Grant Co., Inc. Interchangeable lens ski goggle. 3,896,496, Cl. 2-14.00D.
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Lecroy, James F. Laser miss distance indicator. 3,897,151, Cl. 356-5.000.
Ledochowski, Andrzej; and Stefanska, Barbara, to Starogadzkie Zaklady Farmaceutyczne "Polfa". N-oxides of 1 -nitro-9-dialkylaminoalkylamino/acridine. 3,897,435, Cl. 260-279.00A.
Lee, Michael Adrian. Device for removing dust from a gramophone record. 3,897,069, Cl. 274-47.000.
Lee, Robert L. Jaw movement simulator. 3,896,550, Cl. 32-32.000.
Leeds, Morton W.; and Szur, Alex J., to Airco, Inc. Ethyl beta-(N-methylfurfurylamino) propionate. 3,897,465, Cl. 260-347.400.
Leeds & Northrup Company: *See—*
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Lehwalder, Heinz E. Game board apparatus. 3,897,063, Cl. 273-131.00B.
Leichsenring, Carl Hans; and Kunz, Gustav, to Gesellschaft fur Kernforschung m.b.H. Device for the releasable connection of a dual hose system to a closed container. 3,897,089, Cl. 285-158.000.
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Lelicoff, Jhon. Flying insect repellant assembly. 3,896,995, Cl. 239-36.000.
Lemaire, Gerald. Chair or the like. 3,897,102, Cl. 297-191.000.
Lennox Industries Inc.: *See—*
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Lennox, William Murdoch, to National Research Development Corporation. Endoprosthetic bone joint devices. 3,896,502, Cl. 3-1.910.
Leo Pharmaceutical Products Ltd.: *See—*
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Leon, Shalom A.; Shapiro, Bernard; and Kollmann, George J., to Albert Einstein Medical Center of Philadelphia. Test for systemic lupus erythematosus. 3,897,212, Cl. 23-230.00B.
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Le Rouax, Robert K., to Hydril Company. Blowout preventer with variable inside diameter. 3,897,038, Cl. 251-1.000.
Le Rouax, Robert K., to Hydril Company. Variable inside diameter blowout preventer. 3,897,039, Cl. 251-1.000.
Le Rouax, Robert K., to Hydril Company. Annular blowout preventer with variable inside diameter. 3,897,040, Cl. 251-1.000.
Le Rouax, Robert K., to Hydril Company. Annular blowout preventer with variable inside diameter. 3,897,071, Cl. 277-185.000.
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Levinos, Steven, to Keuffel & Esser Company. Photochromic imaging utilizing tetrazolium compounds. 3,897,252, Cl. 96-48.00R.
Lewis, Donald J., to Allied Chemical Corporation. Vehicle safety system. 3,897,081, Cl. 280-150.0AB.
Li, Norman N.; Brusca, Donald R.; and Mohan, Raam R., to Exxon Research and Engineering Company. Immobilized enzymes and method for preparation. 3,897,308, Cl. 195-63.000.
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Liebsch, Dietrich; Becher, Dieter; Kress, Rudolf; and Sauer, Heinz, to Bayer Aktiengesellschaft. Process for removing distillation residue from crude isocyanates. 3,897,314, Cl. 203-89.000.
Ligouzat, Pierre. Devices for discharging measured amounts of a fluid material. 3,896,976, Cl. 222-228.000.
Linde Aktiengesellschaft: *See—*
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Lindsay, Harry Lee; Angier, Robert Bruce; and Curran, William Vincent, to American Cyanamid Company. Substituted s-triazines and method of use. 3,897,430, Cl. 260-249.500.
Lingenfelter, Guy E.; and Haines, William M., to Gates Rubber Company, The. Power transmission belt having attached vegetation engaging elements and method. 3,896,611, Cl. 56-119.000.
Lippert, Gerhard: *See—*
Vollheim, Gerhard; Troger, Karl-Jurgen; and Lippert, Gerhard, 3,897,499.
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Little, Little J.: *See—*
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Litton Industrial Products, Inc.: *See—*
Orlomoski, Roger W., 3,896,656.
Litton Systems, Inc.: *See—*
Marbury, Fendall, 3,896,755.
Livesay, Richard G., to Minnesota Mining and Manufacturing Company. Tagging explosives with organic microparticles. 3,897,284, Cl. 149-21.000.
Locascio, Jack J., to Rapid-American Corporation. Foundation garment. 3,896,818, Cl. 128-494.000.
Lockhart, David K. Power conversion apparatus for utilizing the force of waves. 3,896,625, Cl. 61-20.000.
Loev, Bernard, to SmithKline Corporation. Pharmaceutical compositions and method of inhibiting gastric acid secretion. 3,897,555, Cl. 424-263.000.
Lohman, Gordon Russell: *See—*
Woodburn, James, Jr.; and Lohman, Gordon Russell, 3,897,184.
Longworth, Alfred, to Radiation Limited. Gaseous fuel burners. 3,897,198, Cl. 431-160.000.
Lopiccola, Joseph F.: *See—*
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Lorant, Ivan: *See—*
Binzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Kaszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 3,897,190.
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Louderback, Allan L.; and Fontana, Anthony J., to Baxter Laboratories, Inc. Blood control standard. 3,897,363, Cl. 252-408.000.
Love, Gordon David, to Silverson Machines Limited. Disintegrated devices. 3,897,013, Cl. 241-46.110.
Lovgren, Anders, to Alfred Lovgren Byggnads AB. Method of controlling drying of timber in a closed room. 3,896,558, Cl. 34-13.800.
Lu, Robert T., to ICI United States Inc. Polyimides from bismaleimides and heterocyclic diecondary diamines. 3,897,393, Cl. 260-47.0UA.
Ludszeweit, Dieter; and Buchegger, Joachim, to Hauni Werke Korber & Co. KG. Apparatus for splicing webs of cigarette paper or the like. 3,896,820, Cl. 131-21.00R.
Lumenition Limited: *See—*
Ford, Eric Harold, 3,896,776.
Lundstrom, Alexis A.; and Schimpf, Luther G., to Bell Telephone Laboratories, Incorporated. Secret transmission of intelligence. 3,897,591, Cl. 179-1.50M.
Lunn, William H. W.: *See—*
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Luossavaara-Kiirunavaara Aktiebolag: *See—*
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Luthi, Oscar, to Ingersoll-Rand Company. Material disintegrating-and-blowing apparatus. 3,897,014, Cl. 241-56.000.
Luthi, Thomas F.: *See—*
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Luttinger, Manfred: *See—*
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Lutz, Barbara M. Button shank depth guide. 3,896,555, Cl. 33-168.00R.
Lutz, L. Richmond, III: *See—*
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Lyle, Samuel P. Overlapping swinging plate internal combustion engine. 3,896,772, Cl. 123-8.470.
Lyons, Bernard J., to Raychem Corporation. Antioxidant comprising a hydroxy aromatic compound containing sulfur and organic phosphite. 3,897,388, Cl. 260-45.80R.
Lyssy, Georges H., to S & T Steiger Engineering AG. Method of manufacturing thin-walled hollow articles of polytetrafluorethylene, apparatus for performing the method and articles manufactured by the method. 3,897,532, Cl. 264-127.000.
M&T Chemicals Inc.: *See—*
Touval, Irving, 3,897,389.
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MacFarland, David R.: *See—*
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MacKenzie, Robert A.; and Lagsdin, Andry. Stabilizer pad for earth-moving apparatus. 3,897,079, Cl. 280-150.500.
MacTurk, William L., to General Dynamics Corporation. Method of making a molded waveguide filter with integral tuning posts. 3,896,545, Cl. 29-600.000.
MacTurk, William L., to General Dynamics Corporation. Method of forming a parabolic antenna. 3,897,294, Cl. 156-245.000.
Madaschefsky, Erich, to Semperit Aktiengesellschaft. Vulcanising mould for pneumatic vehicle tyres. 3,897,181, Cl. 425-47.000.
Maeda, Shohe; Yasue, Masayuki; Aruga, Mitsuo; Saito, Sizuo; and Yasunaga, Ikuo, to Sumitomo Chemical Co., Ltd. Method for producing anhydrous sodium dithionite. 3,897,544, Cl. 423-515.000.

Maehara, Kazuo: *See*—
Sakai, Kazuo; Iwanaga, Ken; Maehara, Kazuo; Nakajima, Tsuyoshi; Yotsuya, Koki; Ookuma, Humio; Baba, Takeo; and Yamanaka, Toshitaka, 3,896,653.

Magnant, Kenneth K.: *See*—
Camp, William S.; and Magnant, Kenneth K., 3,896,662.

Mainka, Christian M.; and Nash, George A., to Morse Boulger, Inc. Incinerator for raw sewage. 3,896,745, Cl. 110-8.00C.

Mains, Harold E.; and Barrett, Fred O., to Emery Industries, Inc. Polybasic acid compositions obtained from polymerized fatty acids. 3,897,468, Cl. 260-407.000.

Maki, Michael W.: *See*—
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Malinowski, Henryk: *See*—
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Maloblocki, Richard E. Stub setting fixture. 3,897,050, Cl. 269-17.000.

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Maly, Neil A.: *See*—
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Mammino, Joseph; and Whittaker, Gary L., to Xerox Corporation. Toners for phthalocyanine photoreceptors. 3,897,249, Cl. 96-15.00D.

Mancini, Timothy R. Diesel injector tube body reforming tool. 3,896,654, Cl. 72-393.000.

Mandroian, Harold. Electrolysis pump. 3,897,173, Cl. 417-73.000.

Mandt, Mikkel G., to Houdaille Industries, Inc. Multiple jet aerator module. 3,897,000, Cl. 239-177.000.

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Alexiev, Boris Vasilev; Stoev, Stoycho Borisov; Spasov, Alexander Vasilev; Maneva, Lilyana Stoilova; Emanuilov, Emanuil Alexandrov; and Golovinski, Evgeni Victorov, 3,897,494.

Mann, James Urquhart: *See*—
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Manning, Artie L. Cutting apparatus for cutting concrete material and the like. 3,896,783, Cl. 125-13.00R.

Marans, Nelson Samuel: *See*—
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Marantz, Daniel Richard, to American Can Company. Double wrap packaging apparatus. 3,896,604, Cl. 53-176.000.

Marbury, Fendall, to Litton Systems, Inc. Heave damping device for ships. 3,896,755, Cl. 114-126.000.

Marchand, Georges Aime. Volumetric divider for paste, especially for dough paste. 3,897,188, Cl. 425-238.000.

Marchi, Vitalino: *See*—
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Marek, Miroslav; Toman, Ludek; and Pecka, Jan, to Ceskoslovenska akademie ved. Radiation polymerization of olefinic monomers in the presence of metal containing catalysts. 3,897,322, Cl. 204-159.240.

Marin, Pierre Dominique; and Tirtiaux, Robert, to Exxon Research and Engineering Company. Anti-rust additive composition. 3,897,349, Cl. 252-33.300.

Marinaccio, Lawrence F., to Mine Safety Appliances Company. Temperature compensated inductive liquid metal level indicator. 3,896,671, Cl. 73-304.00R.

Marinsky, Georgy Sergeevich: *See*—
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Marion Power Shovel Company, Inc.: *See*—
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Maroschak, Ernest J., to Plastic Tubing, Inc. Corrugated plastic pipe with integrally formed coupler. 3,897,090, Cl. 285-260.000.

Marsh, Ogden J.; and Hunsperger, Robert G., to Hughes Aircraft Company. Process for forming electrically isolating high resistivity regions in GaAs. 3,897,273, Cl. 148-1.500.

Marshall, J. Howard, III; and Harrington, Timothy A., to MDH Industries, Inc. Frequency-programmed electron-capture detector. 3,897,344, Cl. 250-386.000.

Marshall, John M.: *See*—
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Martin, Donald J.: *See*—
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Martin, Harlan W., to Favorite Manufacturing, Inc. Collapsible animal cage or the like. 3,896,766, Cl. 119-17.000.

Martin, Henry, to Ciba-Geigy AG. Use of 1-(3-chloro-4-methylphenyl)-3,3-dimethylurea in wheat and barley crops. 3,897,242, Cl. 71-120.000.

Martin, Henry: *See*—
Beriger, Ernst; and Martin, Henry, 3,897,521.

Martin, Jean-Marie Michel. Machine for drying by contact veneers obtained by peeling or slicing wood. 3,896,559, Cl. 34-162.000.

Martin, John T.; Lay, Robert E., Jr.; Stene, Edward L.; and Muscante, Anthony J., to United States of America, Navy. Apparatus selectively responsive to bilevel bipolar pulses. 3,896,767, Cl. 114-21.00W.

Marton, Gyorgy: *See*—
Binzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Kaszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 3,897,190.

Maruoka, Hiroyuki; and Shioyama, Giichi, to Nissan Motor Company Limited. Throttle and ignition timing controlled by clutch and transmission. 3,896,913, Cl. 192-.062.

Marvin Glass & Associates: *See*—
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Maryland Cup Corporation: *See*—
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Masaki, Kenji; and Nambu, Shuya, to Nissan Motor Company Limited. Exhaust gas recirculation control device. 3,896,777, Cl. 123-119.00A.

Maschinenfabriken Bernard Krone GmbH: *See*—
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Mascret, Albert. Automatic appliance for cooking and distributing measured quantities of hot food products. 3,896,715, Cl. 99-356.000.

Mason, Barry, to Betamite Electronic Devices. Valve controlled single needle blood processing systems. 3,896,803, Cl. 128-214.00R.

Massey-Ferguson Services N.V.: *See*—
Delfosse, Gilbert; and Andiano, Jose, 3,897,332.

Massey, Michael J.; and Dunlap, Robert W., to Shenango Incorporated; Duquesne Slag Products Co.; and Standard Slag Company, The. Method for contacting hot, viscous, molten slag with gaseous reactants. 3,897,231, Cl. 65-19.000.

Massonne, Joachim: *See*—
Hellberg, Karl-Heinz; and Massonne, Joachim, 3,897,543.

Massoubre, Jean Marie, to Compagnie Generale des Etablissements Michelin Raison Sociale Michelin & Cie. Apparatus for projecting a molten material into a cooling medium. 3,896,870, Cl. 164-281.000.

Masuda, Mutsuo: *See*—
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Masui, Hiroaki: *See*—
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Maten, Marvin A., Jr.: *See*—
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Mato, Laszlo, to Ben Clements & Sons, Inc. Top-feeding automatic tag-attaching machine. 3,896,713, Cl. 93-88.000.

Matsukawa, Hiroharu: *See*—
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Mattingly, Denis Albert Edward. Apparatus for heating textile yarns and filaments. 3,896,530, Cl. 28-71.300.

Mattler, Martin. Disposable catheter. 3,896,816, Cl. 128-349.00B.

Matumoto, Junzo: *See*—
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Mayled, Edward C. Mailing carton. 3,896,988, Cl. 229-33.000.

Mayr, Eugen: *See*—
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McBain, Charles; and Need, Francis Richard, to Coplastix Limited. Fluid flow control valves. 3,897,043, Cl. 251-328.000.

McCain, Willard E. Excavating machine. 3,896,950, Cl. 214-138.00R.

McCormick, Robert W.: *See*—
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McCoy, David Ross. Stabilized surfactants and their preparation. 3,897,362, Cl. 252-357.000.

McCulloch, Robert P.; and Smith, Stephen H. Golf ball putting cup. 3,897,059, Cl. 273-34.00A.

McEachron, John C.: *See*—
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McEvers, Wilber C. Neckwear cabinet. 3,897,122, Cl. 312-321.000.

McGehee, Bobby L., to Design Technology Corporation. Animal grooming device. 3,896,769, Cl. 119-122.000.

McGrath, John Alan, to British Oxygen Company Limited, The. Venous flow stimulator. 3,896,794, Cl. 128-24.00R.

McHugh, Carl Manning; Webb, Byron Kenneth; and Hood, Clarence Elam, Jr., to Research Corporation. Fruit harvester. 3,896,612, Cl. 56-329.000.

McIntosh, James A., to Mack-Wayne Plastics Company. Container and closure therefor. 3,896,974, Cl. 222-182.000.

McLaughlin, Mano; and Wohlert, Andrew M., to Enertron Corporation. Colorimeter for fish lure selector. 3,897,157, Cl. 356-186.000.

McMath, Jack A.; and Taylor, Charles W., to Dover Corporation. Drybreak coupler. 3,897,091, Cl. 285-311.000.

McMurray, Russell L. Trenching machine attachment for widening trench bottom with dirt removing auger. 3,896,570, Cl. 37-87.000.
McMurtrie, Thomas, to Design Components, Inc. Linear bearing slide. 3,897,119, Cl. 308-6.00R.
McNaney, Joseph T. Light spot pattern formation and color control display apparatus. 3,896,574, Cl. 40-34.000.
McReynolds, James H.: *See*—
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McVay, Malcolm Scott C., to U.S. Chemicals and Plastics, Inc. Method of making an additive package. 3,896,600, Cl. 53-27.000.
MDH Industries, Inc.: *See*—
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Mechanics, Inc.: *See*—
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Medlar, Lewis A., to Honeywell Inc. Sturdy sensing apparatus for measuring the temperature of a heated rubber material during its curing process and method for making same. 3,897,272, Cl. 136-230.000.
Medovar, Boris Izrailevich; Dubinsky, Rudolf Solomonovich; Boiko, Georgy Alexandrovich; Marinsky, Georgy Sergeevich; and Egorov, Sergei Petrovich. Apparatus for electroslag smelting of shaped ingots. 3,896,878, Cl. 164-252.000.
Meeussen, Louis Achilles; Helmberger, Josef; and Staddler, Klaus, to Agfa-Gevaert AG. Method and apparatus for correcting pyramidal error in an optical system with a mirror wheel. 3,897,132, Cl. 350-7.000.
Mehrhof, Werner: *See*—
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Meier, Joseph F., to Westinghouse Electric Corporation. Fast curing, water-resistant laminate made with accelerated melamine-aldehyde resin and accelerated phenol-aldehyde resin and method of making it. 3,897,589, Cl. 428-525.000.
Melby, Raymond C. Supercharged six-stroke cycle combustion engine. 3,896,775, Cl. 123-64.000.
Melnick, Dennis M.; and Kubick, Mark. Ski shovel. 3,897,078, Cl. 280-15.000.
Menapace, Henry R.: *See*—
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Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 2-Amino-4 H-pyrane. 3,897,462, Cl. 260-345.800.
Meyer, Raymond J.; Simpson, Ford, Jr.; and Boland, Michael P., to Aluminum Company of America. Method of sealing and desmudging of anodized aluminum. 3,897,287, Cl. 156-22.000.
Meyer, Rich B., Jr.: *See*—
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Miller, Gale W.; and Geraci, James L., to Cincinnati Biomedical, Inc. Unitary clamp. 3,896,527, Cl. 24-81.0HS.
Miller, Norman K., to Miller Brothers. Door safety edge construction. 3,896,590, Cl. 49-488.000.
Miller, Richard; and Reich, Murray H., to Princeton Chemical Research, Inc. Furnace or thermal black in degradable agricultural mulch. 3,896,585, Cl. 47-9.000.
Mills, Thomas C. Molded case for cassettes. 3,896,929, Cl. 206-387.000.
Miltenburg, Edward W.; Whetstine, Donald L.; and Carson, Howard, to Stainless Medical Products, Inc. Modular motorized wheel chair. 3,896,891, Cl. 180-6.500.
Milwaukee Boiler Manufacturing Co.: *See*—
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Mita, Itaru; Okumura, Shigeo; Yamabe, Shigeru; Funae, Yoshihiko; and Matumoto, Junzo, to Santen Pharmaceutical Co. Ltd. N-(mercaptoacyl)aminoacids. 3,897,480, Cl. 260-470.000.
Mitchell, Henry W., to Crossley Window Co., Inc. Thermally improved window frame and sash. 3,896,589, Cl. 49-425.000.
Mitchell, Howard Lee, III, to Exxon Research and Engineering Company. Iridium-containing reforming catalyst and use thereof. 3,897,328, Cl. 208-139.000.
Mitsubishi Gas Chemical Co., Inc.: *See*—
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Mitsui, Kazuhiko; and Kanehira, Katsuyuki, to Olympus Optical Co., Ltd. Endoscope with view field altering means. 3,896,793, Cl. 128-6.000.
Mitsui, Tsuyoshi; Hiramoto, Takeji; and Imanaka, Mitio, to Hitachi, Ltd. Braking system for an electrically-operated road such as an escalator. 3,896,925, Cl. 198-232.000.
Mittleman, Irving M.: *See*—
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Mizuma, Noriaki; and Yokota, Yuzo, to FMC Corporation. Method for printing textiles using a precoat containing β-1,4 glucan. 3,897,204, Cl. 8-62.000.
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Moilliet, John Lewis; and Ryan, James Ernest, to Imperial Chemical Industries Limited. Method of forming a water-extended acrylic polymer. 3,897,371, Cl. 260-2.50L.
Mole, Leon, to Greengate Cables Limited. Apparatus for the continuous production of laminated electric conductors. 3,897,187, Cl. 425-90.000.

Molitor, Ambrose Leo. Resiliently mounted auxiliary wheel for a tractor. 3,896,868, Cl. 152-13.000.

Molner, Donald Joseph. Image transfer system. 3,897,587, Cl. 428-409.000.

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Morgan, Fred. Heated dispensing apparatus. 3,896,973, Cl. 222-146.0HE.

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Morisawa, Yasuhiro; Kataoka, Mitsuru; Watanabe, Taiichiro; Kitano, Noritoshi; and Matsuzawa, Toshiaki, to Sankyo Company Limited. Substitute pyridinol-containing compositions and methods for the treatment of coccidiosis. 3,897,556, Cl. 424-263.000.

Morrison, John Franklin, to Whirlpool Corporation. Cracked ice maker and transport system. 3,896,631, Cl. 62-71.000.

Morse Boulger, Inc.: *See—*
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Morse, Roger Neill; Pescod, Donald; and Kowalczewski, John Joseph, to Commonwealth Scientific & Industrial Research Organization. Evaporative coolers. 3,897,526, Cl. 261-152.000.

Mory, Rudolf; and Muller, Rolf, to Ciba-Geigy Corporation. Monoazo pigments containing a phenylamino-quinazoline radical. 3,897,411, Cl. 260-154.000.

Moses, Willy B.; and Moore, Nathaniel N., to Bendix Corporation, The. Apparatus for providing selected navigational system engage logic. 3,897,031, Cl. 244-77.00B.

Motorola, Inc.: *See—*
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Moyer, Richard Leroy, to Hercules Incorporated. Positive backing sheet plate lock-up. 3,896,729, Cl. 101-415.100.

Moyne, Jose, to Rhone-Progil. Process for the manufacture of alkyl benzimidazolylcarbamates. 3,897,448, Cl. 260-309.200.

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Murton, Crawford B. Method for refining iron-base metal. 3,897,244, Cl. 75-53.000.

Murton, Crawford B. Refractory lining mixture for hot metallurgical vessels. 3,897,256, Cl. 106-68.000.

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Muselik, Miloslav, to Adamovske Strojirny Narodni podnik. Apparatus for the adjustment of a form cylinder. 3,896,724, Cl. 101-248.00

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Nagele, Immanuel P.; Blakely, Jerald W.; and Vandeventer, Lloyd B., to Coleman Company, Inc., The. Air conditioning system. 3,896,634, Cl. 62-408.000.

Nagy, Charles E.; and Nagy, John F. Double spin knob door lock. 3,896,644, Cl. 70-149.000.

Nagy, Charles E.; and Nagy, John F. Double spin knob door lock. 3,896,645, Cl. 70-149.000.

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Nakagawa, Hiroyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Printing sheet gripping device for use with printing saddle. 3,896,728, Cl. 101-415.100.

Nakagawa, Susumu: *See—*
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Nakatsuka, Ryuzo; Furuta, Mituo; Suzuki, Setsuo; and Kawahara, Nobuyoshi, to Sumitomo Bakelite Company, Limited. Plywood veneer of edge-bonded wet wood pieces and method of making same. 3,897,581, Cl. 428-44.000.

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Newton, Geoffrey Phillip, to Laporte Industries Limited. Polymeric compositions. 3,897,399, Cl. 260-77.5AN.

Nickell, Louis G., to Hawaiian Sugar Planters' Association. Use of penicillin as ripener for sugarcane. 3,897,239, Cl. 71-90.000.

Nickell, Louis G., to Hawaiian Sugar Planters' Association. Use of bacitracin as ripener for sugarcane. 3,897,240, Cl. 71-90.000.

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Nohtomi, Touru, to Mitsubishi Gas Chemical Co., Inc. Process for the production of laminates utilizing pre-treating followed by impregnation. 3,897,588, Cl. 428-436.000.
Norman, Emil P. Comb-cleaning pick construction. 3,896,825, Cl. 132-119.000.
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Ohara, Takashi; Ichihara, Shoichi; Saito, Koichi; and Ono, Tetsuji, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Method for the production of noble metal catalysts. 3,897,368, Cl. 252-466.0PT.
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O'Konski, Theodore S., to Wheeling-Pittsburgh Steel Corporation. Steel building components with attachment means for wall and floor surface elements and manufacture thereof. 3,896,650, Cl. 72-186.000.
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Olcott, Eugene L., to Atlantic Research Corporation. Braking elements. 3,897,582, Cl. 428-114.000.
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Omura, Satoshi; Umezawa, Iwao; Hata, Toju; Shindo, Minoru; Mizoguchi, Masakazu; Oi, Nobuhiro; and Uchiyama, Tomoharu, to Chugai Seiyaku Kabushiki Kaisha; and Kitasato Institute, The. Dodecenoic acid amides. 3,897,428, Cl. 260-247.70H.
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Onnen, James H., to American Air Filter Company, Inc. Method of controlling reaction conditions in a sulfur dioxide scrubber. 3,897,540, Cl. 423-242.000.
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Ono, Tetsuji: *See*—
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Palencher, Jacques, to Lebocey Industrie. Device for the detection of excessive thread tension and thread breakage. 3,896,640, Cl. 66-161.000.
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Pariente, Roger. Assembly device for elements constituting furniture and furniture comprising such devices. 3,896,743, Cl. 108-111.000.

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Paul, Herman L., Jr. Valves with spring valve members. 3,896,834, Cl. 137-625.280.

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Pehr, Harold T. Dispensing pill box. 3,896,968, Cl. 221-288.000.

Pehr, Harold T. Dispensing spout. 3,896,979, Cl. 222-528.000.

Pennington, Donald D. Tethered ball baseball practice device. 3,897,057, Cl. 273-26.00E.

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Petersen, Evy. Coin changer. 3,896,826, Cl. 133-4.000.

Peterson, Donald J.; Ward, James F.; and Damico, Ralph A., to Procter & Gamble Company, The. Process for combatting pests using organotin compounds. 3,897,553, Cl. 424-245.000.

Peterson, Donald J., to Procter & Gamble Company, The. Pesticidal methods employing (organosulfonylmethyl) trihydrocarbyltin compounds. 3,897,560, Cl. 424-288.000.

Petersson, Bengt O.: *See*—
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Petersson, Gosta Erik Mauritz: *See*—
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Petrak, Harry A., to Triple S Industries, Inc. Shock absorbing apparatus. 3,896,908, Cl. 188-280.000.

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Petterson, Tor H. Method of manufacturing of a barrier package. 3,896,602, Cl. 53-36.000.

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Pirsh, Edward A., to Babcock & Wilcox Company, The. Fuel preparation system. 3,896,746, Cl. 110-104.00R.

Pissiotas, Georg, to Ciba-Geigy Corporation. Thiol and dithiol carbamate acid ester derivatives of phenyl formamidine. 3,897,474, Cl. 260-455.00A.

Plan Hold Corporation: *See*—
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Plasser, Franz; and Theuter, Josef. Apparatus for continuously laying track. 3,896,734, Cl. 104-2.000.

Plastic Tubing, Inc.: *See*—
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Pomernacki, Henry, to Illinois Tool Works Inc. Methods for assembling washer members with rotary fastener members. 3,896,539, Cl. 29-430.000.

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Popp, Hanns-Peter; and Grabner, Horst, to Patent-Treuhand-Gesellschaft fur Elecktrische Gluhlampen mbH. High pressure mercury discharge lamp. 3,897,594, Cl. 313-214.000.

Porubcan, Randolph S.; and Sellars, Robert L., to Chr. Hansen's Laboratory, Inc. Stabilized dry cultures of lactic acid-producing bacteria. 3,897,307, Cl. 195-59.000.

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Queen, Charles C., Jr., to United States of America, Air Force. Plug for drive shaft with internal drive spline. 3,896,902, Cl. 184-88.00R.
Quinn, William T., III. Facial identification system with releasably engaged components. 3,896,565, Cl. 35-28.000.
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Reinert, Gerald H. Concrete pumping machine. 3,897,180, Cl. 417-517.000.
Reinwall, Ernest William, Jr., to Illinois Tool Works Inc. Rope lock device. 3,897,161, Cl. 403-211.000.
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Rhee, Jhoon Goo. Protective target device. 3,896,497, Cl. 2-20.000.
Rhodes, Charles Don. Seedcotton compacter. 3,896,720, Cl. 100-226.000.
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Riegler, Ernst; and Schmidt, Manfred, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Tiltable converter self-aligning bearing. 3,897,120, Cl. 308-36.100.
Riegler, Ernst; and Schmidt, Manfred, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Tiltable converter self-aligning bearing. 3,897,121, Cl. 308-36.100.
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Riseman, John H.; Frant, Martin S.; and Krueger, John A., to Orion Research Incorporated. Method of determining hydrogen sulfide. 3,897,315, Cl. 204-1.00T.
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Roest, Robert Jacques; and Ruitenberg, Pieter van, to Airprocess A.G. Injector with holder for an air mixer or the like. 3,896,996, Cl. 239-424.000.
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Roy, Joseph G. Apparatus for atomizing liquid fuels for the combustion process. 3,897,007, Cl. 239-403.000.
Royal, Thomas B., to International Paper Company. Apparatus for mounting a lid on a container. 3,896,607, Cl. 53-287.000.
Ruble, Lloyd J. Machine for sharpening disc blades. 3,896,591, Cl. 51-126.000.
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Russell, John R., to E-Z Floss. Dental instrument. 3,896,552, Cl. 32-34.000.
Ruzic, Hugo; Scholpp, Robert; and Vomel, Paul Gerhard, to International Standard Electric Corporation. Mechanism for sensing the thickness and diameter of coins in coin operated devices. 3,896,916, Cl. 194-102.000.
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Salyer, Ival O.; and Jefferson, Robert T., to United States of America, Atomic Energy Commission. Porous metal structure. 3,897,221, Cl. 29-191.200.
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Sato, Yutaka, to Hitachi Medical Corporation. Doppler effect blood flow meter. 3,896,788, Cl. 128-2.05F.
Satterwhite, Charles R. Multi-wheeled excavator and conveying system. 3,896,571, Cl. 37-190.000.
Satterwhite, Charles R., to Southwest Equipment Developers, Inc. Multi-wheeled excavating and loading system. 3,897,109, Cl. 299-39.000.
Saucy, Gabriel, to Hoffmann-La Roche Inc. 9-Alkoxime decansic acid-Δ-lactones. 3,897,461, Cl. 260-343.500.
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Sbarra, Michael A. Method and apparatus for removing fibrous particles from a conveyor belt. 3,896,924, Cl. 198-230.000.
Sbragia, Ronald J., to Dow Chemical Company, The. Dihydroxyanthraquinone fungicides. 3,897,564, Cl. 424-331.000.

Scans Associates, Inc.: *See*—
Converse, Vernon G., III; Clayton, Robert W.; and Westervelt, James T., 3,896,670.

Scarritt, Francis M., Sr. Water economizing flush tank. 3,896,507, Cl. 4-56.000.

Schadlich, Gunther; and Moraw, Roland, to Hoechst Aktiengesellschaft. Process for selectively deforming a thermoplastic layer. 3,897,247, Cl. 96-1.100.

Schaffer, Marvin B., to R & D Associates. Multi-section projectile and means for firing the same. 3,896,732, Cl. 102-38.000.

Scharlack, Ronald S., to Kelsey-Hayes Company. Skid control system. 3,897,114, Cl. 303-21.0BE.

Schaub, Robert Eugene: *See*—
Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 3,897,483.

Schempp, Eberhard G.: *See*—
Pearce, Jai K.; Schempp, Eberhard G.; and Sieckman, Walter, 3,897,048.

Scherhag, Bernhard: *See*—
Kricsfalussy, Zoltan; Blocher, Karlheinz; Pawlowski, Juri; Scherhag, Bernhard; and Weiler, Raoul, 3,897,541.

Schering Aktiengesellschaft: *See*—
Vidic, Hans-Jorg; Kieslich, Klaus; and Petzoldt, Karl, 3,897,306.

Schertenleib, Francis, to Alter Licensing Establishment. Blow molding process for container of superplastic alloy. 3,896,648, Cl. 72-61.000.

Schick, John W.: *See*—
Davis, Robert H.; and Schick, John W., 3,897,351.

Schimpf, Luther G.: *See*—
Lundstrom, Alexis A.; and Schimpf, Luther G., 3,897,591.

Schindler, Edgar C.; and McEachron, John C., to Nelco Corporation. Electrical junction box for existing wall constructions. 3,896,960, Cl. 220-3.500.

Schisler, Robert C., to Goodyear Tire & Rubber Company, The. Linings for containers for handling corrosive chemicals and the method of preparing said containers. 3,896,963, Cl. 220-63.00R.

Schloemann Siemag Aktiengesellschaft: *See*—
Groos, Horst Hans; and Richardt, Urban, 3,896,652.

Schlotthauer, Roy, to Motorola, Inc. Apparatus for selective plating. 3,897,323, Cl. 204-224.00R.

Schlumberger Technology Corporation: *See*—
Anderson, Ronald A.; and Tixier, Maurice P., 3,896,668.

Schmid, Horst: *See*—
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Schmid, Paul; and Droesch, Albert, to GHH Basel AG. Device for filtering and/or treating liquid or gaseous media. 3,897,342, Cl. 210-445.000.

Schmidt-Kastner, Gunther: *See*—
Huper, Fritz; and Schmidt-Kastner, Gunther, 3,897,409.

Schmidt, Manfred: *See*—
Riegler, Ernst; and Schmidt, Manfred, 3,897,120.
Riegler, Ernst; and Schmidt, Manfred, 3,897,121.

Schmitt, Gerhard Ludwig, to Sperry Rand Corporation. Device for controlling the locking of containers on an orbitable carrier of an article storage device. 3,897,123, Cl. 312-333.000.

Schmitt, Jack N. Roof truss machine. 3,896,717, Cl. 100-100.000.

Schneider, John J.: *See*—
Harding, David G.; Schneider, John J.; and Mead, Lawrence M., Jr., 3,897,033.

Schneider, Winfried. Mosaic printing head with electromagnetically actuated needles with a common yoke for all electromagnets. 3,896,918, Cl. 197-1.00R.

Schocket, Stanley S. Ophthalmic fixation device. 3,897,141, Cl. 351-36.000.

Scholl, Rolland D., to Caterpillar Tractor Co. Blade stabilizer for earth working apparatus. 3,896,899, Cl. 172-4.500.

Scholpp, Robert: *See*—
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Scholtholt, Josef: *See*—
Bender, Heinz; Stachel, Adolf, deceased; Stachel, Ingeburg Lydia Katharina, heiress; Beyerle, Rudi; Nitz, Rolf-Eberhard; and Scholtholt, Josef, 3,897,419.

Scholz, Albrecht: *See*—
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Schubert, George E.: *See*—
DeGeeter, Robert L.; and Schubert, George E., 3,897,115.

Schudel, Peter: *See*—
Bozzato, Giuliano; Pesaro, Mario; Schudel, Peter; Hug-Inderbitzin, Marianne; and Erickson, Robert Edward, 3,897,504.

Schuller, James J., to Pullman Incorporated. Lock arrangement for box car doors. 3,897,094, Cl. 292-283.000.

Schultz, Otto Wilhelm Oswald; Feutlinske, Hilmar; and Gentzsch, Kurt, to Hamburger Hochbahn Aktiengesellschaft. Axle arrangement for vehicles. 3,896,895, Cl. 180-75.000.

Schumacher, Werner, to Robert Bosch G.m.b.H. Fluid flow regulating apparatus. 3,896,844, Cl. 137-488.000.

Schumacher, Werner; and Mayr, Eugen, to Robert Bosch G.m.b.H. Damped consumer valve arrangement. 3,896,856, Cl. 137-625.650.

Schwartz, Georg: *See*—
Vivien, Daniel; and Schwartz, Georg, 3,896,814.

Schwartz, Morris, to Kalart Victor Corporation. Recording and scanning mechanism for a sound slide projector. 3,897,145, Cl. 353-19.000.

Schwede, William. Color dispenser for use with pressurized cans of whipped topping. 3,896,971, Cl. 222-106.000.

Schweizer, Gottfried, to Gertsch AG. Safety ski binding having cable held sole plate. 3,897,077, Cl. 280-11.35K.

Schweizerische Lokomotiv-und Maschinenfabrik: *See*—
Kreissig, Ernst Florian, 3,896,740.

Scodino, Ambrogio; and Raimondi, Adalberto, to Saipem S.p.A. Tong apparatus operated oleopneumatically for lifting a submerged pipeline. 3,897,099, Cl. 294-88.000.

Scohy, John M.; Cremeans, George E.; and Luttinger, Manfred, to Borg-Warner Corporation. Binder resins for traffic paints. 3,897,378, Cl. 260-22.0CB.

Scott Paper Company: *See*—
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Scott, Robert T.: *See*—
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Scott, Sven: *See*—
Bjorklund, Anders; Frelin, Bert; and Scott, Sven, 3,896,945.

Scrivo, Leonard; and Vetter, Warren Charles, to Vicon Products Corporation. Fiber optics element and dental handpiece containing the same. 3,897,134, Cl. 350-96.00B.

Seaberg, David H.; and Purdy, Paul J., to J. I. Case Company. Method for positioning bucket loader. 3,896,951, Cl. 214-152.000.

Sedell, Bengt: *See*—
Barud, Sigvard; and Sedell, Bengt, 3,896,704.

Sedlar, Anthony E.; and Roseberry, Donald E., to Wickes Corporation, The. Front releasable, quick-change tool holder for an orbiting crankshaft lathe girt. 3,896,690, Cl. 82-36.00B.

See, Gary G., to Addressograph-Multigraph Corporation. Electronic data recorder. 3,896,721, Cl. 101-45.000.

Seeley, Wayne C. Arm board. 3,896,799, Cl. 128-87.00R.

Seidel, Peter-Rudolf: *See*—
Becker, Karl Heinz; Boltze, Karl-Heinz; Dell, Hans-Dieter; and Seidel, Peter-Rudolf, 3,897,426.

Seitzer, Walter H.; and Bradley, William S., to Sun Oil Company (Delaware). Process for drying and stabilizing coal. 3,896,557, Cl. 34-10.000.

Seiwa Me Laboratories, Inc.: *See*—
Ono, Kazuaki, 3,896,791.

Sekido, Mamoru: *See*—
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Sellars, Robert L.: *See*—
Porubcan, Randolph S.; and Sellars, Robert L., 3,897,307.

Sellstedt, John H., to American Home Products Corporation. Synthesis of 2-amino-5-aryl-3H-1,4-benzodiazepines. 3,897,416, Cl. 260-239.0BD.

Seltenreich, Gyozo: *See*—
Binzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Kaszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 3,897,190.

Semperit Aktiengesellschaft: *See*—
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Serpolay, Roger Rene, to Etat Francais. Process for local modification of the structure of fog and clouds for triggering their precipitation and for hindering the development of hail producing clouds. 3,896,993, Cl. 239-2.00R.

Severijns, Adrianus Petrus; and Staas, Frans Adrianus, to U.S. Philips Corporation. Method for starting a ^3He-^4He dilution refrigerator. 3,896,630, Cl. 62-56.000.

Seymour, Phillip D.: *See*—
Vail, Edwin G.; Lippitt, Maxwell W., Jr.; and Seymour, Phillip D., 3,896,792.

Shah, Mahendrakumar Bhogilal; and Grossmann, Uwe Frank, to TRW Inc. Power steering gear with relief valve on power piston. 3,896,702, Cl. 91-375.00A.

Shah, Sunil Chunilal, to Cumberland Engineering Company, Inc. Granulator with noise abatement and safety means. 3,897,016, Cl. 241-73.000.

Shape, Norman R., to Owens-Corning Fiberglas Corporation. Method of and apparatus for simultaneously packaging glass strands into individual packages. 3,897,021, Cl. 242-18.00G.

Shapiro, Bernard: *See*—
Leon, Shalom A.; Shapiro, Bernard; and Kollmann, George J., 3,897,212.

Sharick, Paul Robert. Tent structure and suspension means. 3,896,830, Cl. 135-1.00R.

Sharpe, Christopher James, to Boots Company Limited, The. Pharmacologically active anilinobenzothiazoles. 3,897,443, Cl. 260-305.000.

Shaughnessy, Reginald N.; Witty, Robert W.; and Ackert, Robert J., to Algoma Steel Corporation, Limited, The. Method for the production of high strength notch tough steel. 3,897,279, Cl. 148-12.00F.

Shay, Barry M., to ICI United States Inc. Textile treating compositions, process of treating textiles, and textile articles. 3,897,208, Cl. 8-187.000.

Shell Oil Company: *See*—
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Shellman, Carl E., to General Motors Corporation. Transmission control for a transmission having one drive establishing device for two independent drive functions. 3,896,685, Cl. 74-867.000.

Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, to Betz Laboratories, Inc. N-2-nitrobutyl morpholine and 2,2-dibromo-3-nitrilopropionamide as a slime control composition. 3,897,554, Cl. 424-248.000.

Shema, Bernard F.; Brink, Robert H., Jr.; and Swered, Paul, to Betz Laboratories, Inc. 2,2-Dibromo-3-Nitrilo propionamide and pentachlorophenol as a slime control composition. 3,897,562, Cl. 424-304.000.

Shen, Tsung-Ying; Grenda, Victor J.; and Czaja, Robert F., to Merck & Co., Inc. Substituted benzimidazole derivatives. 3,897,432, Cl. 260-256.40Q.

Shenango Incorporated: *See*—
Massey, Michael J.; and Dunlap, Robert W., 3,897,231.

Sheng, Ming N., to Atlantic Richfield Company. Oxidation of isobutylene glycol to alpha hydroxyisobutyric acid. 3,897,489, Cl. 260-531.00R.

Shepherd, Thomas H.; and Gould, Francis E., to National Patent Development Corporation. Hydrophilic polymer coating for underwater structures. 3,896,753, Cl. 114-67.00R.

Sherk, Fred T.; and Hitzman, Donald O., to Phillips Petroleum Company. Integrated process of ammonia production and biosynthesis. 3,897,303, Cl. 195-27.000.

Shigeta, Yoshihiro: *See*—
Suzaki, Kuniyoshi; Shigeta, Yoshihiro; and Yamanaka, Torakiyo, 3,897,026.

Shiley Laboratories, Inc.: *See*—
Fettel, Bruce E.; and Burd, Samuel, 3,896,815.

Shim, Kyung S.; and Martin, Donald J., to Stauffer Chemical Company. Continuous process for the manufacture of alkyl chrysanthemate esters. 3,897,478, Cl. 260-468.00H.

Shindo, Minoru: *See*—
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Shioyama, Giichi: *See*—
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Shipley, Michael T. Hoisting and towing dolly. 3,896,949, Cl. 214-86.00A.

Shirai, Isoo; Suzuki, Takeshi; and Tonooka, Koichi, to Chisso Corporation. Process for producing crystalline propylene polymer. 3,897,407, Cl. 260-88.20R.

Shirakawa, Hideo: *See*—
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Shoemaker, Billy D. Twist-grip control for motorcycle clutch. 3,896,680, Cl. 74-489.000.

Short, James E., Jr.: *See*—
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Shrum, William M., to Maxton Manufacturing Company. Seismic sensing apparatus. 3,896,906, Cl. 187-29.00R.

Shuman, Dennis A.; Meyer, Rich B., Jr.; and Robins, Roland K., to ICN Pharmaceuticals, Inc. 2,6-Disubstituted purine cyclic nucleotides. 3,897,413, Cl. 260-211.50R.

Shurson, Raymond O.: *See*—
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Sias, Roy C., to Continental Oil Company. Process for producing oil-soluble metal sulfonates. 3,897,470, Cl. 260-429.00K.

Sibeud, Jacques Pierre; and Ruff, Charles David, to Rhodia, Inc. Apparatus for the removal of hydrogen sulfide and mercaptans from liquid and gaseous streams. 3,897,219, Cl. 23-288.00A.

Siddall, John B.: *See*—
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Sieckman, Walter: *See*—
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Siewert, Robert M., to General Motors Corporation. Staged internal combustion engine with modulating interstage temperature control. 3,896,774, Cl. 123-59.0EC.

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Silverman, Sebet. Mechanical means to facilitate changeable records. 3,896,575, Cl. 40-64.00R.

Silverson Machines Limited: *See*—
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Simon, Murray H., to Simon, Peter, a part interest. Lamphouse assembly for photographic printers and enlargers. 3,897,147, Cl. 355-37.000.

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Simon, Peter J. Therapeutic traction apparatus. 3,896,798, Cl. 128-75.000.

Simpson, Ford, Jr.: *See*—
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Slatkin, Martin S.; Motycka, David L.; and Disabato, Vincent J., to United Aircraft Corporation. Gas turbine engine for subsonic flight. 3,896,615, Cl. 60-204.000.

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Binzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Kaszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 3,897,190.

Smiltneek, Ralmond J. Debarking method and apparatus. 3,896,863, Cl. 144-311.000.

Smith, Alvin H. Portable golf course. 3,897,067, Cl. 273-176.00G.

Smith, Bruce T.; and Pacheco, Roger S., to Allied Chemical Corporation. Mercury recovery. 3,897,331, Cl. 209-10.000.

Smith, Charles E., to Xerox Corporation. Film transport mechanism. 3,897,146, Cl. 353-26.000.

Smith, George O., to General Motors Corporation. Dual rotary valved internal combustion engine. 3,896,781, Cl. 123-190.0BD.

Smith Kline & French Laboratories Ltd.: *See*—
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 3,897,444.

Smith, Lee M., to Trav-L-File, Inc. Portable file box with file suspension and carrying means. 3,896,962, Cl. 220-22.000.

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Snyder, Harry C., Jr., to Aluminum Company of America. Production of gallium oxide. 3,897,538, Cl. 423-122.000.

Societa' Italiana Resine S.I.R. S.p.A.: *See*—
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Soderblom, Daniel W. Back vibrator and washer. 3,896,796, Cl. 128-36.000.

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Solar Products Corporation: *See*—
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Solheim, Karsten. Golf club head with improved sole and toe portions. 3,897,065, Cl. 273-167.00A.

Solhkhah, Nariman. Vibrator belt. 3,896,795, Cl. 128-32.000.

Solo, Alan J., to Knock-N-Lok International, Inc. Wall fastener. 3,897,035, Cl. 248-217.000.

Solomon, Paul W., to Phillips Petroleum Company. Hydroperoxides. 3,897,501, Cl. 260-610.00R.

Solymos, Frederick, to Westinghouse Electric Corporation. Elevator system. 3,896,905, Cl. 187-22.000.

Son, Pyong-Nae; and Baranwal, Krishna C., to B. F. Goodrich Company, The. EPDM polymers grafted with vulcanization accelerators. 3,897,405, Cl. 260-79.5NV.

Sonnabend, Nancy L. Children's board game apparatus. 3,897,064, Cl. 273-134.0AD.

Sorstokke, Harold E., to Stauffer Chemical Company. Continuous process for producing dialkyl phosphorochloridothionates. 3,897,523, Cl. 260-986.000.

Sortex Company of North America, Inc.: *See*—
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Starkier, Hery. Method of forging components having radially projecting arms, e.g. cruciform components, and to press apparatus for use in carrying out the method. 3,896,651, Cl. 72-260.000.
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Steck, William F., III, to W. R. Weaver Company. Sighting device. 3,897,158, Cl. 356-251.000.
Stecker, Glenroy H.; and Baud, Michael, to United States of America, Navy. Method of and apparatus for testing the surface irregularities of a carbon monofilament. 3,896,669, Cl. 73-160.000.
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Stein, Werner; and Osberghaus, Rainer, to Henkel & Cie GmbH. Process for the production of di- and polyhydroxycarboxylic acids. 3,897,469, Cl. 260-413.000.
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Storz, Karl. Ultrasonic surgical instrument. 3,896,811, Cl. 128-328.000.
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Stubbs, Mayo P. Apparatus for cutting elongate articles. 3,896,692, Cl. 83-471.300.
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Thore, Thomas J., to Glenoit Mills, Inc. Sliver feeding means for high pile fabric circular knitting machines. 3,896,637, Cl. 66-9.00B.
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Utsumi, Yoshikazu. Device for inserting recording tape cassettes in cases. 3,896,606, Cl. 53-266.000.

Uzgiris, Egidijus E., to United States of America, Health, Education, and Welfare. Protein coated electrode. 3,897,326, Cl. 204-299.000.

Vail, Edwin G.; Lippitt, Maxwell W., Jr.; and Seymour, Phillip D., to United States of America, Navy. Real-time cyclic pulmonary function test system. 3,896,792, Cl. 128-2.070.

Valentyik, Laszlo, to Michigan Technological University. Sedimentation device. 3,896,660, Cl. 73-61.400.

Van der Gaag, Cornelis, to N.V. Industrieele Handelscombinatie Holland. Submarine digging wheel which discharges material in an air chamber. 3,896,566, Cl. 37-56.000.

van der Lely, Ary. Implements for the displacement of crop or like material lying on the ground. 3,896,613, Cl. 56-370.000.

Vandeventer, Lloyd B.: *See—*
Nagele, Immanuel P.; Blakely, Jerald W.; and Vandeventer, Lloyd B., 3,896,634.

van Ruitenburg, Pieter: *See—*
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Van Russelt, Michel; Bleiman, Claude; and Mercier, Jean, to Gerdec. Process for the preparation of composite materials having high impact strength and strong rigidity and materials so-obtained. 3,897,385, Cl. 260-42.140.

Varlen Corporation: *See—*
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Vasco Industries Corporation: *See—*
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Vater, Wulf: *See—*
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Vertue, Charles F., to Volstatic of Canada Limited. Apparatus for spraying particulate material. 3,896,998, Cl. 239-106.000.

Vetco Offshore Industries, Inc.: *See—*
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Vetrocoke Cokapuania S.p.A.: *See—*
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Vetter, Warren Charles: *See—*
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Vickers, James L.; and Waycie, Edmund A., to Stone Container Corporation. Packaging machine using two-blank carton system. 3,896,601, Cl. 53-32.000.

Vicon Products Corporation: *See—*
Scrivo, Leonard; and Vetter, Warren Charles, 3,897,134.

Vidic, Hans-Jorg; Kieslich, Klaus; and Petzoldt, Karl, to Schering Aktiengesellschaft. 7-Hydroxy-delta 8-tetrahydrocannabinols and microbiological production thereof. 3,897,306, Cl. 195-51.00R.

Vinton, David S., to Caterpillar Tractor Co. Means to transmit power across articulated vehicle hitch point. 3,896,894, Cl. 180-51.000.

Vivien, Daniel; and Schwartz, Georg. Collagen based threads. 3,896,814, Cl. 128-335.500.

Vogel, Calvin, to GAF Corporation. Flame retardant agent for synthetic plastics. 3,897,346, Cl. 252-8.100.

Vogt, Thomas C., Jr.; and Fitch, John L., to Mobil Oil Corporation. Method of scheduling propping material in hydraulic fracturing treatment. 3,896,877, Cl. 166-250.000.

Volding, Merle J.: *See—*
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Vollhardt, Frohmut: *See—*
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Vollheim, Gerhard; Troger, Karl-Jurgen; and Lippert, Gerhard, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Hydrogenation of chloronitrobenzenes using noble metal catalysts treated with a sulfoxide and a hydrazine. 3,897,499, Cl. 260-580.000.

Volstatic of Canada Limited: *See—*
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Vomel, Paul Gerhard: *See—*
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Von Den Benken, Elisabeth. Shoe molded by induction heating. 3,896,516, Cl. 12-142.00R.

Von Post, Jan Ake; and Petersson, Gosta Erik Mauritz, to Landstingens Inkopscentral. Impregnated laminated pad for mops. 3,896,518, Cl. 15-104.940.

von Schertel, Hanns, to Supramar AG. Hydrofoil for watercraft with lift generation through air supply of the foil underside. 3,896,752, Cl. 114-66.50H.

von Wiesenthal, Peter, to Heat Research Corporation. Method for vaporizing a sensitive liquid. 3,897,194, Cl. 431-11.000.

Vsesojuzny Nauchno Issledovatelsky Institut Plenochnykh Materialov i Iskusstvennoi Kozhi: *See—*
Binzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Kaszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 3,897,190.

Vuilleumier, Ralph O., to Container Corporation of America. Apparatus for erecting carton tubes. 3,896,711, Cl. 93-53.0SD.

Vural, Gulertan, to Koehring GmbH. Vibratory roller. 3,897,165, Cl. 404-117.000.

Vydra, Karel: *See—*
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W. R. Grace & Co.: *See—*
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Wagner, Kuno: *See—*
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Walaschek, John P. Rubberized coal tar pitch emulsion. 3,897,380, Cl. 260-28.5AS.

Walberg, Arvid C., to Arvid C. Walberg & Co. Electrostatic deposition coating system. 3,896,994, Cl. 239-3.000.

Walch, Allan P.: *See—*
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Waldrum, John E., to Amchem Products, Inc. Thermal welding of plastic. 3,897,296, Cl. 156-304.000.

Walker, Billy E. Voice-operated transmit system. 3,897,592, Cl. 179-41.00A.

Walker, Bruce A. Two-wh.el hand truck with elevator. 3,896,904, Cl. 187-9.00R.

Walker, David G.; and Ruland, Norman L., to Tenneco Chemicals, Inc. 1,1,3,4,4,4-Hexachloro-1,2-butadiene and its dimer. 3,897,505, Cl. 260-648.00R.

Wallace, Elmer E.: *See—*
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Wallshein, Melvin. Orthodontic elastic band. 3,896,549, Cl. 32-14.00A.

Walter, Liviu. Refractory siliceous cements and their method of production. 3,897,258, Cl. 106-85.000.

Walters, Leslie K., to General Motors Corporation. Speedometer drive construction. 3,896,676, Cl. 74-12.000.

Walther, William D.; and DeRegnaucourt, Robert A., to Dayton-Walther Corporation. Rim mounting. 3,897,111, Cl. 301-12.00R.

Walther, William D.; and DeRegnaucourt, Robert A., to Dayton-Walther Corporation. Rim mounting. 3,897,112, Cl. 301-13.0SM.

Walther, William D.; and DeRegnaucourt, Robert A., to Dayton-Walther Corporation. Rim mounting. 3,897,113, Cl. 301-13.0SM.

Waltrip, Hobart. Check valve and leak indicator. 3,896,850, Cl. 137-554.000.

Wan, Beatrice Yuck Chaan: *See—*
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Ward, John W., to Union Oil Company of California. Hydrocracking process with stabilized y-zeolite catalysts. 3,897,327, Cl. 208-111.000.

Warnant, Julien; and Jolly, Jean, to Roussel Uclaf. Process for the preparation of steroidal spirolactones and intermediates. 3,897,417, Cl. 260-239.570.

Warner, David A.; and Levin, Irving M. Telescopic optical system. 3,897,133, Cl. 350-55.000.

Wasco Products, Inc.: *See—*
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Washio, Shigeaki; and Kiguchi, Yukiaki, to Taki Fertilizer Manufacturing Co., Ltd. Ethanolamine/organic carboxylic acid composition for accelerating fruit ripening. 3,897,241, Cl. 71-113.000.

Wasserman, Gerald S.: *See—*
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Watanabe, Hirokazu, to Yoshida Kogyo Kabushiki Kaisha. Pull tab for cam lock sliders. 3,896,538, Cl. 29-409.000.

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Waters, Richard A. Tonal percussive musical instrument. 3,896,696, Cl. 84-403.000.
Watson, Geoffrey Walter, to A. I. Welders Limited. Apparatus for sizing and shaping ends of pipes. 3,896,655, Cl. 72-393.000.
Watts, Lewis William, Jr., to Jefferson Chemical Company, Inc. Polyhalobenzonitrile allyl ethers. 3,897,475, Cl. 260-465.00F.
Waycie, Edmund A.: *See*—
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Weber, Heinz, to Telesco Brophey Limited. Telescopic umbrella. 3,896,833, Cl. 135-25.00R.
Weckler, Gerhard; and Mildenberg, Rolf, to Cassella Farbwerke Mainkur AG. Carrier composition and process for dyeing and printing. 3,897,207, Cl. 8-173.000.
Wededeyer, Karlfried: *See*—
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Weingarten, Charles Z., to Kendall Company, The. Multi-chamber syringe. 3,896,805, Cl. 128-218.00R.
Weinguni, Othmar, to J. Bobst & Fils S.A. Guiding system for a strip of material passing through a machine which processes the strip. 3,896,983, Cl. 226-198.000.
Weinstein, David, to Maryland Cup Corporation. Starburst pattern for forming packaging liners and pads from single faced corrugated stock and the like. 3,897,579, Cl. 428-13.400.
Weishaupt, Josef; and Oberpriller, Jakob, to Linde Aktiengesellschaft. Method of and apparatus for the milling of granular materials. 3,897,010, Cl. 241-5.000.
Weishaupt, Paul, to Wagner & Cie AG. Method and apparatus for exposing a light-sensitive layer. 3,897,250, Cl. 96-27.00E.
Weiss, Martin Joseph: *See*—
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Werstein, Frank A.; and Barnes, William R., to International Telephone and Telegraph Corporation. Hanger insert for steel floor deck. 3,896,599, Cl. 52-704.000.
Wessendorf, Richard; and Heitmann, Wilhelm, to Veba-Chemie AG. Glyoxal hemiacetals, their preparation and use. 3,897,503, Cl. 260-615.00A.
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White, Edward A., to International Minerals & Chemical Corporation. Preparation of phosphatic animal feeds. 3,897,575, Cl. 426-511.000.
White, James Judson, to Northern Electric Company Limited. Method of forming silicon gate device structures with two or more gate levels. 3,897,282, Cl. 148-175.000.
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Wiczer, Max; Sarrafian, Vahram K.; and Popovic, Djordje R., to Wico Corporation. Electrical door lock. 3,897,093, Cl. 292-144.000.
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Williams, William H., to Spray Brite. Wet and dry vacuum cleaner. 3,896,520, Cl. 15-320.000.
Williams, William O., Jr. Artificial fishing lure. 3,896,580, Cl. 43-42.310.
Willis, Henry Paul, deceased; and by Decker, Norman E., executor. Differential torque responsive axle for small vehicles. 3,896,893, Cl. 180-19.00R.
Wilson, Bob G., to Dart Industries Inc. Glass batch wetting system. 3,897,235, Cl. 65-335.000.
Wilson, John Charles, to Eastman Kodak Company. Photographic elements containing high temperature-resistant polyamides. 3,897,253, Cl. 96-87.00R.
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Wolf, Leo H.; and Wolf, Hugo M. Dental x-ray film and chart viewing apparatus. 3,896,576, Cl. 40-106.100.
Wolfthal, Maurice, to Stewart Stamping Corporation. Anti-friction die set. 3,897,118, Cl. 308-4.00C.
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Woodburn, James, Jr.; and Lohman, Gordon Russell, to Amsted Industries Incorporated. Apparatus for making bars from powered metal. 3,897,184, Cl. 425-79.000.
Worst, Joseph C., to General Electric Company. Combination lint filter and additive dispenser for automatic washer. 3,896,641, Cl. 68-17.00R.

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Yokota, Tsuyoshi; Asai, Koetsu; Harada, Hisamitsu; and Kominami, Hiroshi, to Mitsubishi Heavy Industries, Ltd. Method for unloading an iron ore being in a state of a consolidated and hardened body and a grab-bucket for use in the same. 3,896,952, Cl. 214-152.000.

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Yoshida, Tsukasa, to Yoshida, Tsukasa. Device for fixedly connecting panels for use in building. 3,896,598, Cl. 52-498.000.

Yotsuya, Koki: *See*—
Sakai, Kazuo; Iwanaga, Ken; Maehara, Kazuo; Nakajima, Tsuyoshi; Yotsuya, Koki; Ookuma, Humio; Baba, Takeo; and Yamanaka, Toshitaka, 3,896,653.

Zaffaroni, Alejandro; and Alza Corporation. IUD having a replenishing drug reservoir. 3,896,819, Cl. 128-130.000.

Zahn, Eric H. Dental model construction. 3,896,548, Cl. 32-11.000.

Zakharzhevsky, Georgy Leonidovich. Direct-flow valve. 3,896,846, Cl. 137-512.100.

Zehr, William J., to Protectoseal Company, The. Blowout nozzle. 3,897,003, Cl. 239-288.500.

Zengel, Hans-Georg; and Bergfeld, Manfred, to Akzo N. V. Production of m- and p-phenylenediamine. 3,897,498, Cl. 260-578.000.

Zeunen, Barthel; Grace, Rex C.; and Dunn, Alvie R., to Capitol Reproductions, Inc. Photographic exposure apparatus. 3,897,149, Cl. 355-97.000.

Zeyns, Johannes; and Enneking, Heinz. Apparatus in a combustion engine including a device for continually measuring and individually distributing to a plurality of fuel injection valves the amounts of fuel appropriate to the amounts of combustion air. 3,896,778, Cl. 123-139.0AW.

Zimmerman, Eli. Brush applicator device. 3,896,822, Cl. 132-79.00B.

Zimmerman Equipment Co. Inc.: *See*—
Zimmerman, Walter H., 3,896,562.

Zimmerman, Richard Henry; and Brenneman, Richard Lee, to AMP Incorporated. Novel electro deposited gold; electrolyte solution to obtain the same; method for producing said gold; and products. 3,897,246, Cl. 75-165.000.

Zimmerman, Walter H., to Zimmerman Equipment Co. Inc. Grain conditioning apparatus. 3,896,562, Cl. 34-174.000.

Zochem Limited: *See*—
Jabalpurwala, Kaizer Esufali; and Malinowski, Henryk, 3,897,248.

Zoecon Corporation: *See*—
Henrick, Clive A.; and Siddall, John B., 3,897,473.

Zygraich, Nathan; and Huygelen, Constant, to Recherche et Industrie Therapeutiques. Herpes simplex type 2 virus vaccine and method of production and use. 3,897,549, Cl. 424-89.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF JULY, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. F. Dormeyer Mfg. Co., Inc.: *See—*
Flentge, Robert W., Re. 28,499.
Allied Thermal Corporation: *See—*
Hedrick, Warren R.; and Meurer, Henry J., Re. 28,492.
Anthes Equipment Ltd.: *See—*
Weeden, Robert G., Re. 28,493.
Aus der Au, Hans-Rudolf: *See—*
Kusenberg, Eugen; Hubler, Ernst; Aus der Au, Hans-Rudolf; and Ernst, Otto, Re. 28,498.
Bowman, James L.: *See—*
Bresee, Heber J.; and Bowman, James L., Re. 28,500.
Bresee, Heber J.; and Bowman, James L., to Tektronix, Inc. Low noise field effect transistor with channel having subsurface portion of high conductivity. Re. 28,500, Cl. 357-22.000.
Ciba-Geigy AG: *See—*
Kusenberg, Eugen; Hubler, Ernst; Aus der Au, Hans-Rudolf; and Ernst, Otto, Re. 28,498.
Drain-Away, Inc.: *See—*
Kundert, Robert L., Re. 28,491.
Ernst, Otto: *See—*
Kusenberg, Eugen; Hubler, Ernst; Aus der Au, Hans-Rudolf; and Ernst, Otto, Re. 28,498.
Fancher, Llewellyn W., to Stauffer Chemical Company. Cinnamyl carbamates. Re. 28,496, Cl. 260-482.00C.
Flentge, Robert W., to A. F. Dormeyer Mfg. Co., Inc. Power pack. Re. 28,499, Cl. 336-92.000.
Gasmire, Richard C., to Owens-Illinois, Inc. Method of and apparatus for making a plastic article. Re. 28,497, Cl. 264-28.000.
Hedrick, Warren R.; and Meurer, Henry J., to Allied Thermal Corporation. Damper unit for controlling air flow. Re. 28,492, Cl. 137-316.000.
Hubler, Ernst: *See—*
Kusenberg, Eugen; Hubler, Ernst; Aus der Au, Hans-Rudolf; and Ernst, Otto, Re. 28,498.
Kundert, Robert L., to Drain-Away, Inc. Roof draining system. Re. 28,491, Cl. 137-142.000.
Kusenberg, Eugen; Hubler, Ernst; Aus der Au, Hans-Rudolf; and Ernst, Otto, to Ciba-Geigy AG. Method of producing a thick-walled cured plastics moulding. Re. 28,498, Cl. 264-327.000.
Langager, Bruce A., to Minnesota Mining and Manufacturing Company. Poly(hexasubstituted melamines). Re. 28,495, Cl. 260-77.50R.
Meurer, Henry J.: *See—*
Hedrick, Warren R.; and Meurer, Henry J., Re. 28,492.
Minnesota Mining and Manufacturing Company: *See—*
Langager, Bruce A., Re. 28,495.
Owens-Illinois, Inc.: *See—*
Gasmire, Richard C., Re. 28,497.
Rowe, Wilson S., to United States Steel Corporation. Method of processing stainless steel strips or sheets. Re. 28,494, Cl. 148-12.0EA.
Stauffer Chemical Company: *See—*
Fancher, Llewellyn W., Re. 28,496.
Tektronix, Inc.: *See—*
Bresee, Heber J.; and Bowman, James L., Re. 28,500.
United States Steel Corporation: *See—*
Rowe, Wilson S., Re. 28,494.
Weeden, Robert G., to Anthes Equipment Ltd. Wire wall partition. Re. 28,493, Cl. 256-65.000.

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Ball, Geo. J., Inc.: *See—*
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Brown, Andrew J., Sr., to Mikkelsens Inc. Begonia plant. 3,750, 7–29–75, Cl. 68.
Byrum, Roy L., to Joseph H. Hill, Co. Rose plant. 3,749, 7–29–75, Cl. 18.
Cordes, Ashur L. Black ash tree. 3,754, 7–29–75, Cl. 51.
Fessler, Kenneth F., to Geo. J. Ball, Inc. Azalea plant. 3,752, 7–29–75, Cl. 56.
Hill, Joseph H., Co.: *See—*
Byrum, Roy L. 3,749.
Mikkelsen, James C., to Mikkelsens Inc. Begonia plant. 3,751, 7–29–75, Cl. 68.
Mikkelsen, James C., to Mikkelsens Inc. Begonia plant. 3,753, 7–29–75, Cl. 68.
Mikkelsens Inc.: *See—*
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Mikkelsen, James C. 3,753.
Weeks, O. L. Rose plant. 3,748, 7–29–75, Cl. 20.

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Archdekin, Francis M.: *See—*
Williams, Clarence D., and Archdekin, 236,082.
Armstrong, William M., R. E. Gardyne, and W. D. Runswick, to Inlite Corp. Lighting fixture housing. 236,150, 7–29–75, Cl. D48—16.
Ashby, Jeffrey L.: *See—*
Gannett, Richard L., Ashby, Welsh, Leo, Howorth, Corba, Carow, and Beck. 236,085.
Askam, John F.: *See—*
Hogg, Derek, Askam, and Wilson. 236,153.
Bajer Industries Inc.: *See—*
Friedberg, Marvin P. 236,151.
Baker, Stanley Z., to J. T. Eaton & Co. Rodent bait feeding box or similar article. 236,114, 7–29–75, Cl. D22—18.
Balbo, Paul. Utensil facilitating snail-eating. 236,064, 7–29–75, Cl. D7—7.
Ball, Douglas C., to Massey-Ferguson Industries Limited. Combined desk and side extension unit. 236,057, 7–29–75, Cl. D6—159.
Beatrice Foods Co.: *See—*
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Beck, James M.: *See—*
Gannett, Richard L., Ashby, Welsh, Leo, Howorth, Corba, Carow, and Beck. 236,085.
Bedel, Denis E., to Westinghouse Electric Corp. Golf car. 236,098, 7–29–75, Cl. D12—16.
Beld, John W., W. G. Kinninger, R. E. N. Klohr, and P. A. Byrne. Comprehensive infant care system. 236,165, 7–29–75, Cl. D83—1.
Bellak, Sonya S. Statuette. 236,137, 7–29–75, Cl. D29—23.
Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Electronic printing calculator. 236,132, 7–29–75, Cl. D26—5.
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O'Neil, Robert. 236,121.
Best, Eleanore. Ladle or similar article. 236,066, 7–29–75, Cl. D7—104.
Birrell, Peter L., to The Cornelius Co. Beverage dispenser or similar article. 236,170, 7–29–75, Cl. D94—3.
Bjorklund, Curt A. Oilburner valve or similar article. 236,115, 7–29–75, Cl. D23—19.
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Bradley, Ken. Combined and cap therefor. 236,088, 7–29–75, Cl. D9—51.
Braid, Malcolm R. Spaghetti fork. 236,069, 7–29–75, Cl. D7—137.
Branscom, Donald L. Rack for bicycles and the like. 236,102, 7–29–75, Cl. D12—158.
Brent, Allan L., and H. Bocian, to Labco Products, Inc. Firing tray for dental prosthetics. 236,123, 7–29–75, Cl. D24—1.
Byrne, Paul A.: *See*—
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Cadiou, Jean. Combined dashboard and steering wheel for an automobile. 236,104, 7–29–75, Cl. D12—192.
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Carter, Donald J., and F. P. Esposito, to National Athletic Supply Corp. Bowling glove. 236,044, 7–29–75, Cl. D2—361.
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Christie, Cornelius W., and R. B. Winslow, to General Electric Co. Telephone answering device. 236,134, 7–29–75, Cl. D26—14.
Clary, Henry J. Wheel. 236,106, 7–29–75, Cl. D12—211.
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Comeaux, Harold J. Garbage bag support and storage device. 236,076, 7–29–75, Cl. D7—193.
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D'Adda, Dario. Combined clock housing and dial face. 236,091, 7–29–75, Cl. D10—26.
Daher, Theodore G., to General Electric Co. Combined hair detangler and holder therefor. 236,167, 7–29–75, Cl. D86—8.
Dart Container Corp.: *See*—
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Dunlop Ltd.: *See*—
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Field, Harrison A. Rear van door. 236,103, 7–29–75, Cl. D.12—196.
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Fishbein, Meyer. Combined battery powered surgical drill and battery canister therefor. 236,166, 7–29–75, Cl. D83—12.
Folberth, William M. Display and demonstrator rack for cylindrical locksets and the like. 236,050, 7–29–75, Cl. D6—114.
Friedberg, Marvin P., to Bajer Industries Inc. Bollard light fixture. 236,151, 7–29–75, Cl. D48—31.
Friedberg, Stanley A. Combination garment display arm and mounting bracket. 236,053, 7–29–75, Cl. D6—116.
Gannett, Richard L., J. L. Ashby, B. G. Welsh, Jr., D. A. Leo, C. W. Howorth, R. E. Corba, R. N. Carow, and J. M. Beck. Dispensing container for margarine or the like 236,085, 7–29–75, Cl D9—9.
Gannett, Richard L., B. E. Welsh, Jr., D. A. Leo, C. W. Howorth, and R. E. Corba. Bottle. 236,087, 7–29–75, Cl. D9—28.
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Gault, Robert. Trash receptacle. 236,077, 7–29–75, Cl. D7—194.
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Golden, Gerald, to Beatrice Foods Co. Reflector or similar article. 236,095, 7–29–75, Cl. D10—111.
Golden, Henry, and S. R. Genca. Utility pail. 236,075, 7–29–75, Cl. D7—187.
Grabovac, Bosko, to Consolidated Devices, Inc. Torque wrench lever. 236,079, 7–29–75, Cl. D8—24.
Gutierrez, Julian. Record holding device. 236,059, 7–29–75, Cl. D6—185.
Haber, Robert. Leg for a serving utensil. 236,065, 7–29–75, Cl. D7—39.
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Peters, Philip H., and J. L. Matrone, to Environment/One Corp. Combined electrical induction heating table top cooking range and oven. 236,067, 7–29–75, Cl. D7—111.
Petrie, Gordon D. Drafting table. 236,045, 7–29–75, Cl. D6—27.
Petterson, Tor, to S. C. Johnson & Sons, Inc. Pressurized dispensing container. 236,084, 7–29–75, Cl. D9—9.
Phillips Petroleum Co.: *See*—
Johnson, Lewis T. 236,168.
Playart Ltd.: *See*—
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Provost, John K., to Venus Scientific Inc. Slow scan television apparatus. 236,135, 7–29–75, Cl. D26—14.
Puritan-Bennett Corp.: *See*—
Beld, John W., Kinninger, Klohr, and Byrne. 236,165.
Quaker Oats Co., The: *See*—
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Rosenberg, Samuel, to Excelsior Pet Products, Inc. Sounding toy for pet animal. 236,148, 7–29–75, Cl. D34—15.
Rotex, Inc.: *See*—
Lower, William E., and Nolte. 236,155.
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Armstrong, William M., Gardyne, and Runswick. 236,150.
Sakamoto, Motoaki, and H. Uchino, to Hitachi, Ltd. Copying machine. 236,157, 7–29–75, Cl. D61—1.
Sato, Masahiro, and S. Mizushima, to Honda Gyken Kogyo Kabushiki Kaisha. Snowmobile. 236,097, 7–29–75, Cl. D12—7.
Schmuck, Frederic E.: *See*—
Schoepe, Adolf, and Schmuck. 236,116.
Schoepe, Adolf, and F. E. Schmuck. Ball cock float. 236,116, 7–29–75, Cl. D23—33.
Schroeder, Peter E., to Gardisette International AG. Curtain fabric. 236,169, 7–29–75, Cl. D92—1.
Schweiger Industries, Inc.: *See*—
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Scott, Delmer D., to Permacast Corp. Automobile wheel. 236,107, 7–29–75, Cl. D12—211.
Servotronics, Inc.: *See*—
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Seymour, Philip F., to Tonka Corp. Toy vehicle. 236,146, 7–29–75, Cl. D34—15.
Shalvoy, John C., to General Electric Co. Iron. 236,078, 7–29–75, Cl. D7—203.
Slawinski, Michael F., and J. J. Cylkowski. Bidet toilet seat. 236,119, 7–29–75, Cl. D23—71.
Smith, Noel H. Statue. 236,138, 7–29–75, Cl. D29—23.
Snyder, Benjamin L., to Snyder Mfg. Co. Television antenna. 236,136, 7–29–75, Cl. D26—14.
Snyder Mfg. Co.: *See*—
Snyder, Benjamin L. 236,136.
Snyder, Paul D., to The Quaker Oats Co. Activity toy. 236,141, 7–29–75, Cl. D34—15.
Souvenir, Inc.: *See*—
Moore, James G., and Oltman. 236,113.
Staats, Henry N., to General Binding Corp. Cooling rack for adhesive bindings. 236,112, 7–29–75, Cl. D19—75.
Staats, Henry N., R. S. Quandt, and V. Struch, to General Binding Corp. Bookbinding machine. 236,154, 7–29–75, Cl. D55—1.
Stirling, Loren D., to Xerox Corp. Input/output terminal. 236,129, 7–29–75, Cl. D26—5.
Struch, Viktor: *See*—
Staats, Henry N., Quandt, and Struch. 236,154.
Sweany, Louis P., to P. R. Mallory & Co., Inc. Audible alarm. 236,096, 7–29–75, Cl. D10—116.
Tacke, William H., to Curtis Products Ltd. Side chair. 236,049, 7–29–75, Cl. D6—69.
Tacke, William H., to Curtis Products Ltd. Chair base. 236,061, 7–29–75, Cl. D6—196.
Takahashi, Mutsumi: *See*—
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Ota, Hiroshi, Takiguchi, and Takahashi. 236,093.
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Tonka Corp.: *See*—
Seymour, Philip F. 236,146.
Trieschmann, Donald C. Tennis racquet holder or the like. 236,052, 7–29–75, Cl. D6—114.
Tsang, Andrew N. F. Vehicle washer. 236,072, 7–29–75, Cl. D7—179.
Uchino, Hisao: *See*—
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Walker, Howell L.: *See*—
Heald, Ervin R., Kelly, Kleckner, Van Dyke, and Walker. 236,100.
Watkins, Berne A. Modular building. 236,108, 7–29–75, Cl. D13—1.
Welch, Ralph E. Facial muscle exerciser. 236,161, 7–29–75, Cl. D83—1.

Welsh, Bruce G., Jr.: *See*—
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Gannett, Richard L., Welsh, Leo, Howorth, and Corba. 236,087.
Westinghouse Electric Corp.: *See*—
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Whitlock, William C. Cat perch and scratching post. 236,140, 7–29–75, Cl. D30—42.
Wiebe, Gerald. Combined electric fuse body and integral handle. 236,125, 7–29–75, Cl. D26—1.
Wilkhahn, Wilkening & Hahne: *See*—
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Williams, Clarence D., and F. M. Archdekin. Adjustable bar for blocking sliding doors and windows. 236,082, 7–29–75, Cl. D8—203.
Wilson, Roger A.: *See*—
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Hogg, Derek, Askam, and Wilson. 236,153.
Winslow, Reynolds B.: *See*—
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Winston, Laura. Face pillow. 236,062, 7–29–75, Cl. D6—201.
Wojcik, Gerald E.: *See*—
Mansur, Fred E., Lohmann, Wojcik, and Martel. 236,130.
Wojcik, Gerald E., R. A. Martel, F. E. Mansur, and L. J. Lohmann, to Owens-Illinois, Inc. Light emitting gas discharge matrix display panel. 236,128, 7–29–75, Cl. D26—5.
Xerox Corp.: *See*—
Stirling, Loren D. 236,129.
Yamamoto, Takeshi, to Hitachi, Ltd. Clothes dryer. 236,152, 7–29–75, Cl. D49—1.
Zemke, Ronald O. Holder for scrub pads or the like. 236,071, 7–29–75, Cl. D7—178.

CLASSIFICATION OF PATENTS

ISSUED JULY 29, 1975

NOTE.—First number, class; second number, subclass; third number, patent number

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CLASS 5
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CLASS 13
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454 3,896,697

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CLASS 86
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CLASS 138

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CLASS 139

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CLASS 140

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CLASS 144

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CLASS 145

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CLASS 164

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CLASS 165

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CLASS 172

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CLASS 173

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CLASS 175

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CLASS 176

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CLASS 179

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CLASS 184

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CLASS 209

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CLASS 212

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CLASS 215

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CLASS 219

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CLASS 220

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CLASS 222

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	3,896,662	3,896,857	3,897,516	3,896,659	3,897,000	20	3,896,634
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DESIGN PATENTS

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PLANT PATENTS

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